THE FIRST GENERAL EPIDEMIOLOGICAL AND MORBIDITY SURVEY OF CHINA.

H. SUTHERLAND GEAR.

W.—P.

To Professor Raymond A. Dart
for making possible my
overseas experiences and
in appreciation of the
inspiration he gave me
throughout my student career.

Harry Gear
12/11/37

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"The good physician first cures the disease of the nation, then human ailments."

Chinese "Ancient History".

"The perfecting of knowledge depends on the investigation of things."

The Great Learning. Confucius.

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PREFACE.

When the Henry Lester Institute of Medical Research of Shanghai was being planned, the Director, Dr. H. G. Earle, decided to establish a Department of Preventive Medicine and Medical Statistics whose function was to be research into epidemiological problems, co-operation with public health organisations undertaking investigation, and assistance in the general programmes of research in the Institute when statistical treatment of any problem was demanded.

Major P. Granville Edge, O.B.E., of the London School of Hygiene and Tropical Medicine was seconded to the Institute to make the preliminary arrangements for the department, while the writer was appointed Associate in Preventive Medicine and Medical Statistics to assist in this work and to take charge of its public health and epidemiological activities. When, in September, 1932, Major Edge and the writer reached China and the organisation of the department was commenced, a major feature of its programme was the launching of a survey of disease prevalence and incidence. This was made possible by an arrangement with the Council on Research of the Chinese Medical Association to which the writer was eventually elected. Such an investigation was obviously a fundamental requirement, as a knowledge of disease types and distribution in China, directly and indirectly affects most other medical and health problems.

Major Edge returned to England in May, 1933, and from then until his departure from China in March, 1935, the activities of the department and its research programme became the responsibility of the writer.

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In the present work are described the major results of the Survey, which featured largely in the department's activities. Something more, however, than a mere local study was the aim of the Survey. It was visualised, and events seem to have justified the vision, as a demonstration of the importance of morbidity as opposed to mortality data, of the place of the general practitioner or hospital officer in a research programme, and the confirmation of collective research as an invaluable function of a medical association. Owing to the necessity of maintaining the interest and enthusiasm of the various voluntary workers reports were issued as rapidly as the preliminary results of analysis became available. With the permission of the Chairman of the Council on Research, and the Editor of the Chinese Medical Journal, it has been possible to include this material in the present report and thereby give a more comprehensive picture than would otherwise have been possible.

The Survey was carried out under certain difficulties due to the conditions of the country, the voluntary nature of co-operation, and to the pioneer form of the method. An exhaustive and complete analysis of the data has not been possible in the present work but only of those results obtained during the author's period of control. The Survey covered the two years 1933 and 1934, but final records were not all received until shortly before the writer left Shanghai in March, 1935. He therefore attempted to treat as many subjects as possible before leaving, the final figures being interpreted in South Africa. Unfortunately literature on Chinese medicine in South Africa is

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very incomplete and consequently only a limited discussion has been possible with many subjects, and this factor has further introduced a certain lack of uniformity in the chapters of this memoir.

The nature of the Survey implies that in the presentation of any of its results many individuals have assisted and to these special thanks are due. Major Edge played a great part in converting the Chinese Medical Association to the need for disease surveys and in many ways was a most helpful adviser in the evolution of the hospital survey. Dr. H. G. Earle, Director of the Institute, was throughout a valuable supporter and critic, and Dr. James Maxwell, Chairman of the Council on Research, proved an unfailing source of reliable and helpful information on the problems of disease incidence in China. Much material was also obtained through the kindness of Dr. Jordan. The enthusiastic voluntary supporters of the Survey, the doctors scattered throughout China, who, under all sorts of trying conditions provided records of their cases are above all praise, and much is owing them for supporting the project so conscientiously. Finally, the author has to thank his staff of the Department of Preventive Medicine and Medical Statistics, who, without mechanical aids, undertook the colossal task of sorting by hand over half a million record cards.

CHAPTER I.

GEOGRAPHY AND CLIMATE.

All who study any aspect of China are inevitably impressed by the size of her population, the greatness of her rivers, plains and mountains, the length of her history, the ramifications of her social system, and, in fact, the vastness and complexity of all her problems. Disease in China is no exception, and when approached from the epidemiological aspect seems incredibly difficult of understanding. So many influences have to be taken into account - racial, social, occupational, climatic and geographical. In this approach it is logical to survey firstly, very briefly, the background or scene where the play of forces between disease and human population takes place.

China is a large part of a very large continent. Her southernmost regions are situated in the true tropics, and her north extends practically to the Arctic Circle. A long, complicated seaboard faces the Pacific Ocean and inland her borders march with the great mountainous and plateaux regions of Central and Northern Asia. In terms of figures the following are some of the main facts:-

Latitude	from 18°N to 53°N.
Longitude	from 74°E to 134°E.
Coastline	5,000 miles.
Total Area	4,278,352 sq. miles. (1)

From south to north, as the crow flies, China (including Manchuria) is over 2,000 miles in length and her east to west distance is almost 1,500 miles. It is not surprising therefore that within this vast land there should be found every type of geographical

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and topographical feature, great mountain ranges, rivers, plains, deserts and forests.

The old geography rested satisfied with mere lists, names of mountains, lengths of rivers, political boundaries and sites of towns, but the new subject has become scientific. Facts are not merely collected and recorded, but are analysed, classified and related, and interpretations are given to such phenomena as climatic variations, population distribution, and political, social, agricultural and commercial customs. This approach to the geography of China is peculiarly fascinating as it leads on to most suggestive ideas as to the path taken by the Chinese in history, and the position they occupy to-day. Climate and geography are inter-related influences on a people, and the fact that China has her particular geographical situation and form explains largely her climate and much of the phenomena of her peoples. Being a component part on the seaboard of a great land-mass China possesses the so-called 'continental climate' modified according to latitude.

The great land areas of Central and North Asia are subject to great radiation fluctuations leading to extreme heat in summer and cold in winter. Thereby follow atmospheric disturbances affecting China. In summer the proximity of the arid deserts, and the movement of air from the south and east Pacific towards these areas leads to a rapid elevation of temperature, extending to and including North China, where summer temperatures are considerably higher than similar latitudes in Western Europe. North and Central China, though in temperate and arctic zones according to latitude, have temperatures

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over 95°F. as daily occurrences in July and August. In the plain areas and delta regions the association of these high temperatures with correspondingly raised relative humidity percentages produces extremely trying conditions.

Summer, therefore sees tropical c onditions of heat and humidity extending over the whole region and affecting all populations not fortunate enough to be living in mountainous areas where altitude diminishes these unpleasant influences. In such conditions the expected reactions on human populations occur. China has a high incidence of tropical and summer disease conditions. Gastro-intestinal infections, cholera, helminthic infections, and others have ideal circumstances in which to spread.

Winter, owing to the reversal of the summer atmospheric circulation with winds sweeping from the great cold areas of Mongolia and Siberia, brings bitterly cold conditions, snow, ice and sleet right down and across the Yangtze Valley. A complex of happenings follows the arrival of the extreme cold and wet, as on the one hand are produced cases of suffering and misery associated with respiratory infections, and even death from cold, while the cold in itself reduces human activity and destroys or retards those disease processes so prevalent in summer. This play of climate and season on the disease populations will warrant further discussion in a later chapter.

Though typical of North China and the Central or Yangtze Region these remarkable fluctuations of season lose their prominence or practically disappear on proceeding to the extreme south. These southern regions, of which the climate of Hongkong, Canton, Swatow and Amoy may be instanced, are both situated in the tropical belt and are protected from the arctic winds by intervening mountainous areas.

Passing from this brief survey of the general climatic picture to an examination of the regions of China in their internal topography the significance of the mountains and rivers becomes obvious. China is largely a mountainous country interrupted by three great river basins, the northerly river contributing to the formation of the Great Plain of North China. Consequent upon this land structure there has arisen the unequal distribution of China's people. Rugged, hilly areas can support but few people, but the rich alluvial ground of river basins and deltas can give sustenance to tremendous numbers, especially of a predominantly agricultural people like the Chinese.

Between 80 per cent. and 90 per cent. of the population look directly to the soil for their existence. The soil, the seasons, and the play of the elements therefore loom large in their thoughts, customs and beliefs. Throughout history runs this emphasis on agriculture, and from the evolution of methods of irrigation, crop rotation, and soil fertilisation, has followed the progress of Chinese civilisation itself. Sheng Nung, one of the Chinese deities, typifies the intimate relationship of agriculture to other social activities. In the mythical period of Chinese history before 2500 B.C. Sheng Nung is alleged to have taught the Chinese people how to plant different types of grain and the tillage of the soil, and it is he too, who, as the discoverer of the earliest medicinal herbs and plant drugs is called the Father of Medicine. As

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late as the Manchu Dynasty at the spring equinox the Emperor himself annually took part in a ploughing ceremony at the Temple of Agriculture in Peking, an obeisance to the Founder of Agriculture (2). To-day the 'old-style' Chinese doctors and the drug shops still worship at his shrine (3).

Dependent so largely upon the fruitfulness of the soil the Chinese have massed in the fertile regions, and though China is such a vast country this necessity has resulted in a very unequal distribution of her population. As Cressey points out every square inch of suitable land is forced into use, but that even so "six-sevenths of the population are concentrated in one-third of the area ...." (4). Such is the density that figures of 326 persons per square mile exist for Eastern China; but Cressey gives a truer relationship in the number of persons per square mile of cultivated land which is 1,479, an amazing fact of tremendous significance in its bearing on social, medical and health problems.

These great agricultural plains and areas are the basins of the three great rivers, the Yellow River (or Hwang-ho), the Yangtze-kiang, and the West River (or Si-kiang), and the Great North Plain which has an alluvial origin in the deposits through the centuries of the Hwang-ho (Figure 1). This is a process still active, because periodically, following years of silting, the river breaks the laboriously constructed dykes, and floods vast areas. The battle between dykes and river, though also conducted on the Yangtze, is at its grimmest along the banks of "China's Sorrow" or the Hwang-ho. Time and again has this area been the scene of death, famine and disease following the floods.

Figure 1. The Provinces of China.

The Yangtze River too exacts its toll, and as recently as 1931 and 1932 millions of people were rendered homeless, countless thousands perished and only gigantic efforts restored the land.

The rivers are more than the scenes of great population concentration; they are also the channels of Chinese commerce. Water-borne traffic has for countless centuries been the life-blood of the State. Along the rivers and the great network of canals culminating in the Grand Canal tribute rice passed to Peking, while means of travel and conveyance of goods were dependent upon these highways. The rivers and water-ways therefore figure largely in the transmission of disease and the spread of epidemics.

Cholera has strikingly and repeatedly given demonstrations in China's history of such a part played by water-ways, as epidemics starting in the south and proceeding up the coastal towns have spread inland along the trade route of the Yangtze and its tributaries with devastating results. Such a disease easily travels the water-routes on account of the countless thousands of the floating populations found in the junks and sampans, and who practically never set foot ashore, but live on the water, drink the water, and treat the water-way as a sewer.

The absolute necessity for extracting the last vestige of subsistence from the soil has led to the marvellous development of irrigation in China. Canals, irrigation channels, and terracing are features of her agricultural landscape. Especially is this true of the delta areas and in the Yangtze Valley and the south where the staple article, rice, is produced. The farmer is for long periods working in swampy conditions, providing thus the suitable

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setting for all the helminthological life cycles for which China is notorious. The topographical and climatic zones of the rivers in South and Central China are where <u>schistosomiasis</u>, <u>paragonimiasis</u>, <u>clonorchiasis</u> and <u>ancylostomiasis</u> hold sway.

Another striking feature of the map of China is the Great North Plain, which, it has been indicated, is the consequence of the floods and silting of the Yellow River through countless ages. Cressey (4) calls it "a land of vast antiquity and romance, the scene of dynasty upon dynasty, one of the most intensely used regions of its size on earth". In the north it reaches the Great Wall of China, which region marks the channel through which successive waves of invading Tartars, Mongols and other nomadic horsemen of the great plains swept into China, introducing anthropological elements still to be seen in the human material of the northern provinces. Eastwards the boundaries are the seas and bays of the Pacific, southwards it merges with the Yangtze region and in the west it is limited by the various mountain ranges of Shensi and Honan.

With a population of eighty million extremely active and industrious people the North Plain must loom large in any social or health discussions, and later will be indicated various diseases which are here prominent and a brief account will be given of the Ting Hsien Experiment which may mean much in the uplift of these people.

Westerly, China merges into Tibet and Upper Burma, the regions of vast mountain ranges and high plateaux. The mountains of China have been compared with the fingers of an outstretched hand, the palm of which lies in Tibet and Upper Burma. Though so much of

China/.....

China is mountainous and rugged the provinces of Yunnan and Szechwan in the far west are particularly high in altitude, a geographical fact influencing their climate and their nosography. Yunnan lies largely in the tropical zone, but her altitude is responsible for the presence and form of diseases usually found further north.

Varied though her geographical and climatic conditions are, China is frequently arbitrarily divided into two regions with certain general differences. North China is exposed to the rigors of an arctic winter, is dry and arid, and grows chiefly wheat and grain crops, while South China is warm with a subtropical climate, has a high rainfall and subsists on rice. In the present work, when the material has justified geographical division, three regions have been classified - North China, Yangtze Region and South China - but the latter two present no great fundamental contrast.

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CHAPTER II.

HISTORICAL AND SOCIAL ASPECTS.

It is trite to remark that China boasts a long recorded history and an old established civilization, yet both are factors in the study of disease as it exists in the country to-day. Although from the nature of the present memoir any considered study of Chinese history and social evolution is impossible, it nevertheless requires cognizance of certain phases.

Sheng Nung, already referred to as the Father of Agriculture is also the Father of Medicine, and was one of the earliest figures appearing in the mythical beginnings of China more than 5,000 years ago. Another mythical being concerned with medicine was Fu-Hsi, to whom has been traced the first elements of Chinese philosophy. These require some description for they still dominate Chinese religious and social life, and it is to such beliefs that Chinese classical medicine looks for the raison d'être of its practices and procedures.

The Pa Kua (Figure 2) or eight trigrams were said to have been revealed to Fu-Hsi by the appearance of this mystic geometric figure on the back of a dragon horse which rose out of the waters of the Yellow River. A pictorial representation of fundamental Chinese philosophical ideas exists in the Pa Kua as the black and white components of the central circle, the Yang and the Ying, and the eight different combinations of the concentric short and long lines form the eight trigrams. Various meanings are ascribed to the trigrams such as water, fire, life, wind, rigidity, cold, earth, mountains. The Pa Kua can still be seen in the course of a stroll

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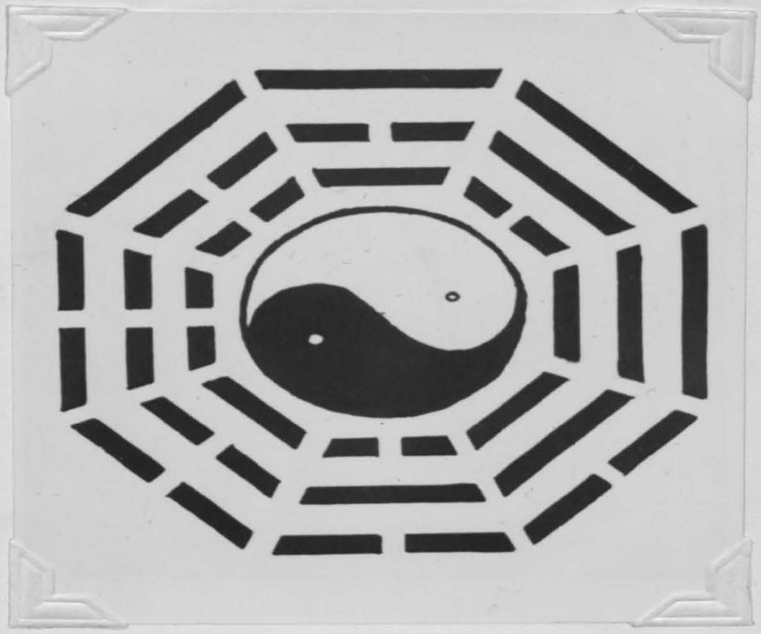

Figure 2. The 'Pa Kua' or Eight Trigrams.

through any Chinese city. The fortune-teller will have it on the banner or notice on his booth, it appears in temples, shrines and halls, and is a common symbol in use in the art designs of all craftsmen.

The Yang and Ying are the two basic principles of life governing all living things and entering into all matter. The Yang principle is the male principle, the Ying the female, and this contrast runs through all nature. They are respectively active and passive, living and dead, hot and cold, strong and weak, and so on for all characteristics, elements and functions. All matter is composed of a combination in various forms of the Five Elements, water, earth, fire, wood and metal, controlled by the two principles, Yang and Ying.

Out of such a cosmogony grew also the philosophical ideas of Chinese medicine. The Yang and Ying principles and the Five Elements enter into the composition and control of all parts and organs of the human body, and dependent upon their harmonious balance and interaction a healthy state is achieved. Through any disturbance of this equilibrium, by a weakening of the Yang or Ying due to external or internal variations of these principles in the universe disease will result. Thus the Chinese medical philosopher achieved a most satisfying system completely explanatory of all natural phenomena, and which is accused to-day for its stagnating influence on curiosity and the enquiring, critical mind. The grip of the system on the Chinese masses still holds and attracts them to the old-style doctor, and delays the seeking of treatment and advice from the scientific medical practitioner.

The more material aspects of Chinese social life and medicine, however, have been traced back to Sheng Nung, who, in 3000 B.C. taught them the tillage and irrigation of the soil.

The dependence of the Chinese upon the soil is more than ever true to-day. Droughts, floods, or any failure of crops means catastrophe and starvation; famine and disease are shadows always present to the Chinese population. "Agriculture forms the foundation of the social and economic structure of the nation, and only as the rural districts prosper can China advance" is Cressey's statement (1). It follows that with centuries of experience and observation the Chinese have long discovered the need for crop rotation, and the urgency of restoring the impoverished and exhausted soil. Sheer necessity has been the stimulus which has resulted in the use of everything of value as fertiliser, and from which arose the careful retention and return to the soil of human ordure. Such a practice has provided the necessary links for the completion of many helminthic life cycles, and the means of spread of gastro-intestinal diseases.

Arising in the valleys of the Yellow River in the dim mists of antiquity the Chinese race has, in all its extensions and conquests, retained until the present its farming habit. There has been no great industrial or commercial epoch to stimulate a large scale exploration and intercourse with other lands. Geographical and economical isolation have contributed largely to the self-contained and separate development of a Chinese civilisation, and Chinese thought, literature, customs and social administration

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have been unusually free from outside influence. Inspired by the great philosophers, Confucius, Lao Tzu and Mencius, who lived in the Chou Dynasty (1122-249 B.C.), a way of life, especially as demanded by Confucianism, has had an unusually strong hold on the people, and its moral code with such creeds as filial piety, family unity and supremity has governed social life and habit to a surprising degree. To such influences are to be ascribed the pre-eminence of the family and ancestor-worship. The desire for a family, to continue the family, as ingrained in the Chinese, is a dominating force of considerable significance in the application of scientific methods in political, social and health reconstruction of China.

Isolation, however, has not been absolute for Buddhist teachings were introduced from India in the Han Dynasty (206 B.C. - A.D.221). This religion was considered by Morse (2) to have led to a considerable activity in Chinese herbal medicine which produced many discoveries of valuable remedies though its main emphasis was on mental and spiritual procedures, faith-healing and hypnotism.

Again indicative of the agricultural basis are the very highly developed practices of herb and drug treatment.

The Pen T'sao or Chinese Pharmacopoeia goes back to Sheng Nung, but successive dynasties have seen it modified, enlarged and rewritten until, in the Ming Dynasty, Li-Shih-chen produced 52 volumes of the work containing 1,871 drugs (3). This large number of remedies was derived from every conceivable article - vegetable, animal and mineral. Numerous

investigators/.....

investigators have tilled this rich field and have given the world some of its modern remedies such as kaolin and ephedrine. Observation and empirical discovery have put many valuable drugs into the hands of the old Chinese herbalists and a recent striking confirmation of this has been given by Read (4). This author has shown that many of the drugs of the ancient pharmacopoeia contain important biological principles and that their use was correctly prescribed in deficiency diseases. In view of the value in the Pen T'sao it is a pity that so many references have been made by Europeans to the grotesque and ludicrous such as the use of saliva and urine of animals in queer compounds. Such instructions as, for instance, "the ash of the skin and fur of a black dog for rheumatic pain" and "elk meat eaten with shrimps, fresh vegetable, or plums, weakens the semen" (5) of the Chinese Pen T'sao are paralleled by the prescriptions of Europe in the Middle Ages.

Chinese medicine had reached a highly organised state, and acupuncture had been introduced from Japan in the Chou Dynasty (1122-249 B.C.), but it was in the Han and Tang Dynasties that medicine reached its zenith and that doctors were first trained in medical schools. To-day, however, the old-style medicine is unorganised and drugs and mixtures are prescribed by all. Nevertheless it is still to the exponents of the old medicine and the old philosophy that the Chinese largely turns, a factor never to be overlooked in studying disease prevalence.

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This clinging to the old medicine is but one of many signs of the innate conservatism of the Chinese people, and such an attitude to the past is not unexpected in view of the Chinese philosophy, the emphasis on the family and the system of ancestor-worship. Custom is a force which cannot be lightly ignored in the introduction of the new medicine and hygiene. Overcrowding, eating from communal dishes, expectorating, overclothing, close shutting of living rooms, and use of human excretions for fertiliser, are part and parcel of the average Chinese attitude and habit.

Poverty, however, is the most obvious characteristic of the Chinese community. Millions, especially the farmers, live a hand to mouth existence. The land is overcrowded and cannot provide sufficient to feed all. Poverty in its train brings poor housing, overcrowding, undernourishment and disease. Tao (6) has stated that "in terms of the currency of the United States of America and Great Britain at the present rate of exchange, it is noteworthy that the range of the average annual income and the average annual expenditure of Chinese working families under investigation is incredibly low, being G. $25 and G. $100 or between £5 and £20".

In the country districts the fear of starvation and want has driven the farmer and his family hard and has stimulated his industry, thrift and ingenuity so that the Chinese can well claim to be amongst the most hard-working and careful of people. Every blade of the thousands of square miles of rice is planted by hand. The town, on the other hand, has been the scene of another form of his activity and industry. Craftsmanship has ever had a high place as a Chinese

virtue/.....

virtue, and here too the family has worked as a unit, small boys being early put to learn the bronze work, lacquer painting or silk weaving of their fathers. As in other fields, so in the industrial and commercial field, China is now undergoing the revolutionary changes following contact with Western civilisation. The factory is a spreading institution and mass production methods are rapidly increasing. Consequences as terrible as those typical of England in the Industrial Revolution have already followed. Lack of authoritative control and the relentless drive of economic necessity have brought about the evils of child indentured labour, long hours in unhealthy factories, and complete absence of any consideration of health standards (7).

It is in the cities that density of population makes the deepest impression. Anyone who has seen the teeming thousands in the narrow lanes and shuttered houses of any Chinese city realises the importance of such conditions as factors in many diseases, especially those of respiratory origin.

The impact of the Occident on China is causing momentous changes. For thousands of years the social and administrative system remained basically unchanged. A magisterial network of officers recruited through the famous examination system represented the Emperor, and Chinese literature, philosophy and religious ideas cemented the people. In spite of dynastic rises and declines, and Tartar and Mongol invasions, the race evolved its own social and cultural history, but the explorers and traders of the West, stimulated by Marco Polo, eventually set in motion the forces

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which led up to the disappearance of the Imperial order in the overthrow in 1911 of the Manchu Dynasty and the foundation of the Chinese Republic by Sun Yat Sen.

Amongst the most powerful of the influences introduced from the West was that of medicine which first obtained a permanent hold in Canton where British medical missionaries established a dispensary in 1820. From these beginnings the missionary net has been cast wide, and to-day the missionary, lay and medical, is to be found in the remotest of villages throughout the vast land. Many of their teachings have played a part in some of the changes in outlook which are now occurring in China. Woman, for instance, is by the modern educated Chinese, accepted as a co-operator and equal in a way which is far removed from the seclusion and inferiority borne by her in the past. Binding of feet went with the cutting off of the queue, and the Chinese is rapidly becoming familiar with the wireless, aeroplanes and railways. Throughout her 450 million people China is experiencing gigantic social and cultural sensations, the outcome of which cannot but affect and be of importance to the whole world. Rival war lords are fighting and striving for power, communism is being attacked by Chiang-Kai-Shek, the present national leader, and many other disturbances make the country to-day a land of insecurity and disunity. Nevertheless China is assuredly on the move and whatever her destination may be, will demand the notice of the world. The changing customs, the growing commerce and industry, and the birth of a new national spirit in such stupendous numbers of

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people cannot be ignored, and, as much as any factor, the diseases of China become of interest, not purely for their significance in China, but for their importance to all nations.

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CHAPTER III.

MEDICAL ORGANISATION IN PRESENT-DAY CHINA.

It is difficult to discuss the organisation of any component of life in China to-day as the country, being still in the throes of disruption following the collapse of the Imperial system, has yet to develop a nation-wide control of any service or function. Nevertheless a description of existing medical and health services and institutions is a necessary introduction to the study of disease incidence and prevalence.

That the Chinese masses still largely believe in and follow the old-style practitioner or herbalist has already been shown. The title of herbalist, however, covers a heterogeneous collection of "doctors", from the true disciple who is a member of one of the old guilds, to the mere charlatan and trickster. Nevertheless, the influence exerted by them on China's present government is not to be disregarded. As recently as April of this year (1) an attempt was made to secure official recognition of herb medicine and for the establishment of herbal medical schools. It will be many years before this form of practice will have dwindled and lost its hold on the masses; its herbs, prescriptions, temples and philosophic mysticism intrude into any consideration of the healing art in China.

Modern medicine secured its first foothold early last century in Canton, and in spite of a rival appeal has succeeded in reaching every province in some form or other. Its early struggles and victories and its slow penetration into remote regions are largely the record of medical mission work. It was in 1836 that the first association was formed, the Medical Missionary Association of China, which in the course of time amalgamated with the National Medical Association of China to form the present Chinese Medical Association.

The Chinese Medical Association is the great organisation of the modern medicine and numbers several thousand members of whom the great majority are Chinese. The remainder represent not only large numbers of British and American practitioners, but a surprising number of other races. It is a most active body, producing both a journal in Chinese and one in English, and holding biennial general conferences. The investigations and work of its various councils, such as those on research, public health and publications have done much for the progress of medicine. Such important subjects as the official definition of status and standard of practice, the control of medical schools and curricula, the furtherance of the interests of modern medicine in official and lay circles are actively pursued. It works in happy harmony with the National Health Organisation and such other official bodies as the health services of the treaty ports of Shanghai and Tientsin.

This association however, though powerful, does not include all modern practitioners. There are approximately 5,390 modern physicians in China to-day of whom 87 per cent. are Chinese (2). Numbers of

these/.....

these belong not to the Chinese Medical Association but to the Tung Jen Society consisting of returned Chinese students of medicine and pharmacy of Japan. Japanese trained doctors, both Chinese and Japanese, are not inconsiderable in number, but as yet they have not tended to identify themselves very fully with the other groups. This difference of origin and form of medical training is one of the interesting but perplexing features of the medical personnel of the country.

The earliest doctors and medical missionaries of Canton, Drs. Pearson, Parker and Livingstone, had found it necessary to train assistants and thus began modern medical education in China. To-day there are 30 medical schools throughout China consisting of "four supported by the National Government, two by the army, six by the Provincial Government, sixteen by private parties (missionary) and two by foreign organisations, namely British and Japanese. At these schools for the year 1933-1934 there were 2,978 men and 638 women attending"(3). Chinese doctors trained overseas for the same year numbered 83, returning chiefly from Japan, Germany, Britain and America.

Practitioners of the modern school are almost entirely confined to the cities as it is here alone that they have any hope of securing conditions suitable for the undertaking of scientific medicine. Shanghai is especially popular, claiming 22 per cent. of the total doctors. Outside of the chief cities and larger towns practice in effect is limited to the medical missionary.

The medical missionary introduced modern medicine into China and he remains its chief apostle. Moreover, in the smaller remote country towns it is only he who is willing and able to bring succour and relief to the sick. Until certain changes occur in the government and sentiment of many of the Chinese communities, the Chinese physician will be faced with risks and even dangers in attempting the new medicine amongst his own people. Among other pitfalls, legal action for mal-praxis and blackmail at present are only too common for the native practitioner in private practice. In such circumstances only the medical missionary, Chinese or foreign, working in an institution can hope to succeed.

China has been the scene of much missionary endeavour. Missionaries of all denominations are represented but fortunately a happy co-operation has marked most of their efforts, especially in the field of medicine. In this their work usually revolves round a hospital, however small, and indicative of their range and extent is the fact that between 230 and 250 mission hospitals exist. Attached to these institutions are about 275 foreign (non-Chinese) and 400 Chinese doctors. The work of mission hospitals and doctors is given in the following quotation from Shields (4):-

> "Looking backward over its history and viewing the present facts of medical missions, one can say that the work has been eminently successful. It has paid from the evangelistic standpoint, it has paid in the healing brought to millions, it has paid in that it introduced

Western/.....

Western medicine to the Chinese, began the translation of medical literature, and the training of students in scientific medicine. At present, with few exceptions, mission hospitals and schools in general are considered the best in the country ....."

Not content with such fruitful development of their own activities, the medical mission organisations are now seeking more and more to link up their work and aims with the plans and programme of the national authorities for, as Hume recently appealed to them - "This is a new day in medicine, and the work to be attempted is so vast that it can be effectively done only if all those who have any relation to it pool their forces of personnel and of buildings so that a common work may be better done" (5).

In Nanking is centred the headquarters of the National Government which has now remained in power for over ten years and is gradually extending its influence over the outer provinces. Health and medicine are represented in this government by the Central Health Organisation, the two main institutions of which are the National Health Administration and the Central Field Health Station. The first is the administrative control, while in the second is featured a definite principle of the government, viz: to investigate and experiment with, in the field, various health and sanitary procedures before their application to the country. Field epidemiology, training health personnel, experimental methods of sanitation and health propaganda are the present

important/.....

important phases of the work of the National Health Administration.

Subsidiary to the National Health Administration are several other organisations, the most highly developed of which is the National Quarantine Service. This is now under the control of Dr. Wu Lien-teh, but is a direct descendent of the old Imperial Customs Medical Service inaugurated by Sir Robert Hart in 1860. The modern service has stations at all the chief ports. Government laboratories are attached to the Central Field Health Station, the National Epidemic Prevention Bureau of Peiping and the Central Hygiene Laboratory of Shanghai. There are also schools of midwifery and nursing, while a further notable activity is in the Tongshan Rural Health Station.

The work of the National Health Administration owes much to the support and guidance received from the League of Nations Health Organisation. It was in 1930 that the League assisted in preparing the three-year plan of reorganisation, providing for:-

> "(1) The establishment of a central field health station and the development of the Central Hospital as a nucleus of the national medical and health services, (2) the creation of an experimental medical school, (3) the gradual extension of the National Quarantine Service, (4) the co-ordination of the various modern centres of public health activity in the country." (6)

As with many other central organisations the National Health Administration functions as a

supervisory/.....

supervisory and advisory body co-ordinating and assisting the work of various provincial and municipal health services. The provinces of Kiangsi, Yunnan, Hunan, Chekiang, Shensi, Kansu, have proceeded with plans to form health services, mostly of the uniform type recommended by the central authority, viz:

1. Diagnostic Laboratory.
2. Provincial Hospital.
3. Midwifery School and Mother and Child Welfare Centre.
4. School Health Centre.
5. Polyclinic.
6. Health Propaganda Department. (7)

Though the programme is being actively pursued, conditions have not yet allowed full development or stabilisation in most provinces.

Municipal health administration is rather a complicated question. Only such cities as Shanghai, Nanking, Peiping, Canton and Changsha have advanced to any degree of complete services. Shanghai has three municipal health services reflecting the curious constitutional construction of this area. The International Settlement has a highly organised department with sanitation services, hospitals, clinics and laboratories. The Chinese City has but recently undertaken similar work though rapid strides are being taken to improve the situation, and finally, there is the department of the French Concession. In Peiping the municipal health work has had happy relations and co-operation with the health department of the great Peiping Union Medical College, but in Nanking, Canton, Changsha, the various developments have been more truly national in origin and guidance. Tientsin displays somewhat similar disease control

and/.....

and evolution of municipal health work to that seen in Shanghai.

China has attracted philanthropic interests other than missionary. The work of the two great American funds in this direction is well known. Both the Rockefeller Foundation and the Milbank Memorial Fund have played no mean part in advancing medical and health ideals. Peiping Union Medical College, a model medical training institution, is a byword for efficiency, progress and enthusiasm far beyond the borders of China. Its Chinese graduates are rapidly taking their places as leaders of every phase of medicine and health throughout China and in their turn are stimulating and guiding other Chinese students. Its research programme has been unusually comprehensive, and many of the epidemiological investigations of its public health men will be discussed in this work.

By its overseas scholarships grants to numerous bodies such as the National Health Administration and the Ting Hsien Experiment, and by its recent suggestion for developing rural health work, the Foundation has proved to be a major instrument for assisting in China's adoption of the new ideas and practices.

Similarly the Milbank Memorial Fund has fostered investigation and study into sanitary and medical problems. The Ting Hsien Experiment, which will often require reference, owes much to this fund which, apart from medical and health fields, has contributed greatly in attempting to assist China to solve her problems.

Finally/.....

Finally, in describing medical organisations of China, notice must be taken of the 'Mass Education Movement'. In the northern province of Shantung in the 'hsien' or county of Ting Hsien, a most enterprising and bold experiment is being tried. In a population of 400,000, the inhabitants of a town, several villages and numerous hamlets and farms, Mr. "Jimmy" Yen with several enthusiastic co-operators is trying out methods and practices of rural sociology, education, agriculture, administration and health and medical services.

Methods of nursing, sanitation, and of providing medical care are being tested and gradually there is emerging a means of general administration including all aspects of social life which it is the desire of the founders of the movement to see emulated by rural areas throughout the country. They want methods and procedures which practice has proved are suitable in every way to Chinese conditions. Such is the significance of Ting Hsien that the following quotation from a publication of Dr. C. C. Che'n in charge of its public health is given as indicative of its aims:-

> "........ we must apply scientific medicine by utilising the peculiar advantages of our historical and social conditions. For illustration, in Western countries since preventive medicine was developed after curative medicine of a scientific nature had been widely generalized, a separate machinery has evolved for each with evidences of friction between them. China, on the other

hand/.....

hand, is still a virgin soil for developing a practice of medicine in its complete form. It would be foolish for China to create a similar division within the field of scientific medicine, and it would be even more so to evolve an independent machinery for each." (8)

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3. T'ao Lee. "Some Statistics on Medical Schools in China for the Year 1933-1934." Chinese Med. Jour. 49: 894, 1935.

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5. Hume, E. H. "The Place of Mission Hospitals and Medical Schools in the National Health Programme of China." Chinese Med. Jour. 49: 946, 1935.

6. Report. "Report of the Health Organisation for the Period October, 1932, to September, 1933." Quar. Bull. Health Organ. League of Nations. 11: 495, 1933.

7. Note. "Public Health in China." Chinese Med. Jour. 50: 993, 1936.

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CHAPTER IV.

PREVIOUS EPIDEMIOLOGICAL STUDIES.

The diseases of China have had a fascination for medical writers and observers from earliest times. That even medical statistics and epidemiology came within the purview of the ancients may be surmised from the following extract from Wong and Wu:-

> "The Chou Rituals, 10th century B.C. state that at the end of the year the work of the doctors is examined and the salary of each fixed according to the results shown. If the statistics show that out of the cases treated all get well, every satisfaction may be felt. If, however, 1 out of 10 dies, the results are only fair; if 3 out of 10 die, they are poor; if 4 out of 10, they are bad." (1)

The interpretation of the ancient Chinese literature is difficult. From past dynasties scores of immense volumes have come down with information presented in the allegorical and symbolical style dear to the Chinese, but almost completely bewildering to the European. Such ideas as the Yang and Ying and Five Elements, astrology, and involved religious and philosophical beliefs pervade the structure of the old medicine. Therefore it is purely conjectura to attempt any estimation of the extent of any epidemiological discoveries. Broadly speaking, however, as disease was to them an expression of such external forces as climate and season influenced by spirits and the Yang and Ying balance, the ancients

may/.....

may be said to have had an epidemiological outlook.

Though in the Han Dynasty, one, Ts'ang Kung, gave a description of clinical records of 25 patients and case histories were kept by some writers of the Sung Dynasty (A.D. 960-1297) few attempts at formulating an index of the amount of disease were made.

Scientific estimates of disease prevalence and descriptions of its distribution had to await the arrival of modern medicine. The medical missionaries of last century were good chroniclers of all they saw. They were stimulated to write of the new and strange diseases of the great country and also by contact with its ancient medical and herbal lore. Gradually from their contributions was woven a rough pattern of the major diseases, but strangely enough the first concerted survey of disease was not a missionary effort, but was undertaken by the Chinese Imperial Maritime Customs. The foundation of this service was a landmark in the epidemiological history of China. Sir Robert Hart did not consider his medical officers stationed at the various important sea and river ports as merely doctors treating disease. He visualised the service as an instrument for research and with the able assistance of Dr. Jamieson, a famous circular was sent out. This deserves to be considered as a medical statistical classic and no apology is needed for reproducing it here.

"<u>Inspector General's Circular No. 19 of 1870</u>.

Inspectorate General of Customs,
Peking.
31st December, 1870.

Sir,

1. It has been suggested to me that it would be well to take advantage of the circumstances in which the Customs Establishment is

placed/.....

placed, to procure information with regard to disease amongst foreigners and natives in China; and I have, in consequence, come to the resolution of publishing half-yearly in collected form all that may be obtainable. If carried out to the extent hoped for, the scheme may prove highly useful to the medical profession both in China and at home, and to the public generally. I therefore look with confidence to the co-operation of the Customs Medical Officer at your port, and rely on his assisting me in this matter by framing a half-yearly report containing the result of his observations at .... upon the local peculiarities of disease, and upon diseases rarely or never encountered out of China. The facts brought forward and the opinions expressed will be arranged and published either with or without the name of the physician responsible for them, just as he may desire.

2. The suggestions of the Customs Medical Officers at the various ports as to the points which it would be well to have especially elucidated, will be of great value in the framing of a form which will save trouble to those members of the medical profession, whether connected with the Customs or not, who will join in carrying out the plan proposed. Meanwhile I would particularly invite attention to:-

(a) The general health of .... during the period reported on; the death rate amongst foreigners; and as far

as/.....

TABLE 6 : RETURNS FROM THE SEVENTEEN HOSPITALS PROVIDING RECORDS OF ALL PATIENTS FOR 1933.

DISEASE.	Severance, Seoul.	Cheeloo, Tsinan.	Menzies, Hwaiking.	St. Paul's, Kweiteh.	University, Nanking.	Red Cross, Shanghai.	Lester, Shanghai.	General, Nanchang.	General, Wuhu.	Kwangchi, Hangchow.	Union, Hankow.	General, Changteh.	Hudson Taylor, Changsha.	Presbyterian, Hengchow.	Mission, Swatow.	General, Canton.	C.M.S. Yunnanfu.	TOTAL.
1. Typhoid and Paratyhpoid Fevers...	173	29	-	4	189	147	177	119	34	142	70	24	64	18	103	70	153	1,516
2. Typhus....	11	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	10	24
3. Relapsing Fever	-	56	-	-	4	1	51	6	3	1	14	-	-	-	2	1	47	186
4. Smallpox..	2	2	1	1	26	2	12	2	1	4	1	3	1	1	19	11	4	93
5. Measles..	11	11	-	1	17	-	-	4	3	4	-	-	2	5	13	6	114	191
6. Scarlet Fever..	15	48	6	9	11	11	13	-	-	15	1	1	1	-	-	1	10	142
7. Diphtheria	25	32	1	21	91	7	21	2	3	7	12	2	3	2	4	10	34	277
8. Influenza.	190	22	20	20	399	86	693	161	19	143	142	21	120	48	10	58	175	2,327
9. Cholera..	-	-	-	1	5	-	4	-	8	6	5	3	21	6	29	1	-	89
10. Dysentery	40	314	11	67	223	106	322	210	82	247	88	154	148	58	112	39	271	2,492
11. Plague..	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12. Cerebro-spinal Fever.	4	7	1	-	12	16	12	3	4	4	6	1	1	3	57	14	4	149
13. Tuberculosis of the Respiratory System.	510	467	64	219	556	400	695	369	208	694	474	169	504	96	103	321	220	6,069
14. Other Tuberculous Diseases.	491	505	87	230	270	166	505	329	140	330	204	107	264	158	131	111	166	4,194
15. Leprosy..	18	98	-	1	8	3	25	56	13	81	8	3	4	20	121	55	113	627
16. Venereal Diseases ...	1,029	798	388	353	1,119	308	2,311	485	312	1,447	563	686	858	758	457	279	792	12,943
17. Malaria..	50	147	29	71	522	67	185	167	101	990	138	79	77	179	93	440	414	3,749
18. Kala-azar	-	115	36	108	12	3	4	-	1	1	1	-	-	-	-	-	-	281
19. (a) Schistosomiasis..	-	-	-	-	6	12	13	7	8	3	35	9	1	-	-	-	-	94
(b) Other Helminthic Infections..	624	68	22	114	86	35	130	56	30	240	48	111	547	130	1,836	104	191	4,372
20. Other Infections and/or Parasitic diseases...	340	427	96	83	448	295	689	179	145	332	93	148	115	378	216	231	269	4,484
21. Cancer and other Tumours ..	323	321	141	204	218	77	497	119	157	377	166	102	121	120	372	258	115	3,688
22. Rheumatic Conditions.	160	98	35	67	200	60	361	51	61	215	100	98	307	75	125	132	455	2,600
23. Diabetes.	10	24	2	4	3	17	10	-	-	9	2	1	11	1	6	9	8	117
24. Beriberi.	53	-	1	-	37	42	292	51	9	34	14	2	67	3	15	115	104	839
25. Other General Diseases	39	54	4	8	15	16	25	11	9	11	12	15	16	2	12	39	106	394
26. Diseases of the Blood.	63	41	4	52	34	20	52	44	11	109	32	16	78	11	44	54	75	740
27. Acute and Chronic Opium Poisoning	13	40	3	33	86	52	588	66	38	126	88	33	38	6	8	4	438	1,660
28. Other Chronic Poisoning ...	9	4	-	1	3	10	29	5	1	8	36	3	5	9	-	-	9	132
29. Cerebral Haemorrhage, Apoplexy, etc. ..	55	42	11	29	30	22	85	12	10	46	33	13	43	5	5	27	37	505
30. Trachoma.	106	568	128	555	603	76	813	365	44	539	143	163	209	443	1,106	444	600	6,905
31. Diseases of the Ear, and Mastoid Sinus.	553	722	64	156	403	18	1,007	156	110	541	71	74	154	238	167	442	243	5,119
32. Other Diseases of (a) The Eye ...	811	1,298	153	454	699	78	1,286	272	129	407	321	233	350	593	692	578	613	8,967
(b) Nervous System and Sense Organs ...	709	173	50	160	151	107	311	76	34	102	140	55	140	37	58	132	231	2,666
33. Diseases of the Circulatory System ...	523	444	53	149	561	395	1,167	301	211	561	299	208	350	185	303	212	632	6,554
34. Bronchitis ...	301	232	31	80	464	125	581	217	44	435	104	114	276	75	132	276	906	4,393
35. Pneumonia - all forms	93	60	9	3	176	110	124	58	11	47	68	13	52	12	69	59	78	1,042
36. Other Diseases of the Respiratory System ...	759	461	37	57	507	225	673	85	89	486	108	72	143	89	261	390	398	4,840
37. Diarrhoea and Enteritis ...	334	77	24	53	359	89	479	67	40	302	85	107	210	90	248	132	499	3,195
38. Appendicitis ..	80	33	11	10	85	37	111	10	15	23	29	6	4	2	2	55	9	522
39. Hernia, Intestinal Obstruction ..	62	81	8	34	53	38	150	23	22	64	30	24	42	16	24	29	28	728
40. Anal fistula, fissure	91	75	36	62	116	46	190	55	51	73	50	23	55	28	67	28	31	1,077
41. Diseases of the Liver and Biliary Passages...	127	37	4	32	40	27	75	22	5	19	30	17	8	18	17	39	77	594
42. Other Diseases of the Digestive System.	1,535	1,172	284	532	1,690	425	2,369	520	300	1,769	544	331	549	456	702	945	1,812	15,935
43. Nephritis....	81	53	6	49	86	30	111	59	11	96	30	29	40	29	58	64	189	1,021
44. Other Diseases of the Genito-urinary System..	1,319	428	68	281	929	342	824	245	165	675	308	205	268	179	355	423	728	7,742
45. Diseases and Conditions, Pregnancy, Childbirth, Puerperium	323	161	27	49	741	158	218	115	56	335	622	37	164	41	119	323	721	4,210
46. Diseases of the Skin, Cellular tissue, Bones and Organs of Locomotion ...	3,652	2,216	453	765	2,767	2,204	13,794	1,505	1,709	4,164	900	1,361	2,338	2,469	1,492	1,212	2,185	45,186
47. Congenital Malformation and Conditions Early Infancy	65	51	6	14	28	43	40	7	9	34	20	7	20	24	40	96	75	579
48. Suicide..	6	1	1	3	5	-	101	3	2	9	14	-	-	1	3	-	117	266
49. Other Conditions of Violence	1,069	458	125	474	1,200	1,164	11,308	893	486	1,722	638	388	309	449	730	480	533	22,426
50. Ill-defined and Miscellaneous Conditions	443	233	57	323	2,341	269	1,296	990	134	738	420	104	398	102	376	630	260	9,104
TOTALS	17,300	12,804	2,598	5,996	18,634	7,987	44,832	8,558	5,088	18,767	7,360	5,375	9,486	7,668	10,914	9,379	15,299	208,045

as possible, a classification of the causes of death.

(b) Diseases prevalent at ....

(c) General type of disease; peculiarities and complications encountered; special treatment demanded.

(d) Relation of diseases to
(Season.
(Alteration in local
(conditions - such
(as drainage, etc.
(Alteration in
(climatic conditions.

(e) Peculiar diseases; especially leprosy.

(f) Epidemics
(Absence or presence.
(Causes.
(Course and treatment.
(Fatality.

Other points, of a general or special kind, will naturally suggest themselves to medical men; what I have above called attention to will serve to fix the general scope of the undertaking. I have committed to Dr. R. Alex. Jamieson of Shanghai, the charge of arranging the reports for publication.

3. Considering the number of places at which the Customs Inspectorate has established offices, the thousands of miles north and south and east and west over which these offices are scattered, the varieties of climate, and the peculiar conditions to which, under such different circumstances, life and health are subjected, I believe the Inspectorate, aided by its Medical Officers, can do good service in the general interest in the direction indicated; and, as already stated, I rely with confidence on the support and assistance of the Medical Officer at

each/.....

each port in the furtherance and perfecting of this scheme. You will hand a copy of this Circular to Dr. .... and request him, in my name, to hand to you in future, for transmission to myself, half-yearly reports of the kind required, for the half-years ending 31st March and 31st October - that is, for the winter and summer seasons.

I am, etc.,

(Signed) Robert Hart, I.G.

The Commissioners of Customs:-

Newchwang.	Chinkiang.	Takow.
Tientsin.	Shanghai.	Amoy.
Chefoo.	Ningpo.	Swatow and
Hankow.	Foochow.	Canton. "
Kiukiang.	Tamsui.	

The half-yearly reports required in terms of the circular were collected and analysed, appearing in composite reports issued by the Customs Service. For a period of over 40 years, viz: 1870 to 1911, they continued to appear, an achievement calling for the greatest admiration. Such a continuous series comes to have immense value for students of any aspect of disease in China, and particularly is it an essential preliminary to understanding the epidemiological problems of the country. New diseases peculiar to Western physicians were reported, but more important, rough seasonal and geographical varieties were noted. As the material is in the form mainly of descriptive accounts by different port medical officers the criteria for a standard

survey/.....

survey of disease incidence and prevalence as accepted to-day were absent. Nevertheless, the Imperial Maritime Customs Medical Service paved the way to this form of research and provided a rich store of data which is still yielding fruit.

Collective research thus begun became also one of the interests of the medical missionaries. As far back as 1887, in the first volume of the China Medical Journal, a correspondent urged missionary hospitals to place on record in the journal summaries of their annual reports (2). This suggestion bore some fruit, but it was not until the establishment of the Research Committee of the Chinese Medical Missionary Association that a comprehensive programme of collective research was undertaken. This Committee in 1913 initiated a system of surveys appealing to hospital medical officers to co-operate in the study of several selected subjects. For instance, faecal samples were examined from various parts of the country providing valuable clues to the distribution of such intestinal parasites as ancylostoma and fasciolopsis. The examination of blood smears too laid the foundation of the present knowledge of malaria on which Faust later elaborated a more complete knowledge.

In recent years many surveys have been made, usually with one particular disease as an objective. Faust (3)(4) has been the organiser of two of these, malaria and schistosomiasis, while the work of Wu Lien-teh on plague distribution is well known (5). Hookworm too, has been the subject of a special survey by the Hookworm Commission (6).

Another line of approach to the study of the epidemiology of disease in China is that advocated by Maxwell (7). As editor of the Chinese Medical Journal for many years, he has frequently urged that missionary and other hospitals have a bounden duty to issue annual reports. Further he insists that to justify study and analysis such reports must use recognised disease nomenclatures and follow uniform classifications. His work is producing results and missionary hospitals now seek to include disease tables of increasing accuracy and uniformity in their reports. Eventually, with such comparable reports coming in from institutions throughout the country, a wonderful harvest will be stored for the medical statistician.

Individual hospitals and medical schools have conducted numerous investigations of an epidemiological nature. Those given above, for instance, originated in most cases in the Peiping Union Medical College. Other workers of this institution have made similar investigations as, for example, Maxwell on osteomalacia (7), and Korns on tuberculosis (8). Leprosy, kala-azar, malaria, venereal diseases, cholera, enteric, have figured in many reports of other institutions such as the National University of Shanghai, the Cheloo University of Tsinan, etc.

For long consecutive accounts of most diseases of public health importance, reliance has to be placed on the archives of the medical departments of the Shanghai Municipal Council and of the Hongkong Government. Rabies, cholera, scarlet fever, smallpox, enteric, receive practically their only historical

account/.....

account of any reliability in the records of the annual reports of the Shanghai Municipal Council. These publications enable factors of season, climate, race and others to be estimated. Although in the absence of accurate censuses the various death rates are limited in value, those given by Shanghai and Hongkong remain still the only group of any succession and accuracy. Mortality is as incompletely described as morbidity in China.

In South China the Hongkong medical reports are an important guide to the history, incidence and importance of many diseases. Annual health reports based on a uniform model have appeared for many years, which, amongst other diseases, enable the ebb and flow of plague and malaria to be followed.

Official and semi-official records and investigations of an epidemiological nature are becoming more numerous and valuable. The first of these to be noted is the work of the National Epidemic Prevention Bureau of Peiping. One of the functions of this body is to keep track of outbreaks of communicable disease. Hospitals and physicians throughout the country were circularised and invited to return postcard accounts of infectious disease coming under their notice. The satisfactory response enabled the Bureau to issue monthly bulletins which were also incorporated in the monthly epidemiological reports of the League of Nations. In 1928 this work was transferred to the National Health Administration. Extended and improved, this form of notification is now the function of the Departments of Epidemiology and Vital Statistics,

the/.....

the standard postcard and monthly returns being supplied by hospitals, the National Quarantine Service and local health authorities. This is an important official work as major communicable diseases such as plague, typhus, malaria and smallpox are to some extent kept under observation. Quantitative results are not obtained, the postcard form indicating the degree and prevalence of disease by such terms as "sporadic", "prevalent", "epidemic" and "absent" (9).

The Department has in hand other epidemiological work. In the Tongshan Experimental Area it is compiling vital statistics of a rural population and observing the occurrence of disease, while it is co-operating in the field study of malaria, schistosomiasis and kala-azar. In a recent report it has issued a useful table of the present knowledge of the geographical distribution of the major diseases (10).

Another venture launched by the National Health Administration is leading to interesting studies on the epidemiology of cholera. This is being undertaken by the Central Cholera Bureau of Shanghai, the activities of which are noted in the annual reports of the National Quarantine Service.

As examples of other statistical and epidemiological investigations reference must again be made to the experimental area at Ting Hsien. In this area a simple system of birth and death registration has been evolved, school medical inspection is a routine procedure, dispensary and clinic records are collected and, finally, a health survey of a thousand families

is/.....

is in process of analysis. Another field experiment of a similar nature is that which has been conducted for many years by the Peiping Union Medical College. This project, under the auspices of the Rockefeller Foundation, has been amongst the most fruitful and from it data are steadily accumulating on numerous subjects, including those of vital and medical statistics.

Briefly summarising the facts given in this chapter it is seen that many attempts and many approaches have been made to the study of epidemiology and medical statistics in China but that these are still largely untilled and unorganised fields. These previous investigations are of interest and importance in connection with the subject of the present memoir as the general disease survey on which it is based was a natural outcome of and was influenced by its predecessors in its initiation and evolution.

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CHAPTER V.

METHODS OF STUDYING DISEASE OCCURRENCE.

Prior to launching a morbidity survey in China some thought was given to the available methods of studying disease occurrence in general.

The earliest measure of the influence of disease on a population was one of mortality. The old English bills of mortality led to the presentation of John Graunt's classical work, the first study in vital statistics (1). Full recognition of the value of mortality rates followed William Farr's contributions to the Registrar-General's annual reports. Interpreted by Farr death rates became a most powerful weapon in the campaign for sanitation and hygiene waged so strenuously in England last century, and much of John Simon's success is attributable to the data he obtained from Farr which demonstrated the correlation of death with filth, overcrowding and preventable causes of disease (2).

That death rates on a national basis are yet to be instituted in China may be easily understood. National organisation is lacking, accurate population enumerations have not been taken and there is no general births and deaths registration. Such mortality figures as exist are either of purely local significance as those of Shanghai and Hongkong, or have been secured as the result of specially designed scientific effort.

These latter studies include those of the Ting Hsien Movement (3), the publications of the Central

Field/.....

Field Health Station in regard to the vital statistics of Chu-Yung (4) and those of the Peiping Health Station (5), (6), (7). Full development of mortality recording must await the general strengthening of social organisation in China and therefore investigators must appeal to morbidity studies for an insight into the extent and degree of disease.

In other parts of the world also there is an increasing tendency to replace mortality by morbidity as an index. This change is "partly because of the levelling down of mortality in the human population" (8), but also follows from the growing appreciation of preventable loss due to sickness and defect in all branches and phases of human activity. Death is but one expression of disease, and as the "Lancet" tersely says "What do we know of disease that only death rates know?". (9)

Though morbidity does not have the precision of mortality it has its own place in medical statistics. Though sickness is difficult to define and while there is no doubt as to death as a fact, yet, as Sydenstricker puts it "statistics of illness can afford an indication of vitality that is not less biologically significant and is more illuminating than mortality. They portray the condition of a people's health far more delicately than death rates. They reveal the prevalence and incidence of disease in a population in a manner that is as useful to the student of society as clinical observation of the individual patient is to the physician." (10)

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The search for suitable assessments of morbidity has been most active in America where perhaps the Hagerstown studies by Sydenstricker are the best known (11). Many diverse methods have been used both there and elsewhere. The most generally available index throughout the world is notifiable disease. Long period collections of communicable disease are amongst the official records of Great Britain, some of the American states and some European countries. The English figures are the most reliable and have contributed much to the present epidemiological knowledge of such acute infectious fevers as enteric, scarlet fever, diphtheria and tuberculosis. As many of the defects of communicable disease records are common to other collections of morbidity data, their discussion will be given later.

Notification of communicable disease in China has been attempted in only a few of the larger cities with any degree of success. Shanghai archives are the best source of this type of information. As the European populations of these cities are served fairly completely by a general practitioner service and as only a minority of the Chinese seek treatment from the modern doctor, the European data are reliable, while the Chinese are far from complete. Nevertheless Shanghai records are of some assistance in following seasonal variation and cyclical phenomena of the epidemic diseases, especially cholera. A great improvement in observations on cholera is already to be discerned since the various health authorities concerned in the administration

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of Shanghai formed the Central Cholera Bureau. The epidemiological committee of this body is extending the means for discovering cases of cholera and has issued several valuable reports (12).

Sickness records of some considerable importance are also being accumulated by such official organisations as national health insurance systems, military and naval medical services and school medical services. These have not the historical or time sequence of communicable disease records and, further, have rarely been analysed for epidemiological purposes, so that as contributions to the study of morbidity they have yet to achieve their full import. This is however certain to follow as by means of such records large proportions of national populations are coming more and more under continuous medical observation and care. The reports of the Chief Medical Officer to the Ministry of Health, London, include sections on the health of the English insurance populations which contain much extremely important information. It has been possible to assess the degree of invalidity associated with various groups of disease, such as the respiratory and digestive disorders, which otherwise may not have been given due weight.

School medical examinations both in America and England have had most important practical and scientific results. The beginnings of dental disease, physical defects, mental abnormalities and many other preventable conditions, it was discovered, were in pre-school periods and this stimulated the various later developments of public health such as infant and child welfare.

China has not been unaware of these methods of estimating the physical condition of her peoples, but once again the fluid condition of her state organisation remains an obstacle to any national efforts. Several local studies of school medical inspections have been made, the most important of these having been published in the reports of the National Health Administration. Defects noted in order of frequency were trachoma, dental disease, enlargement of tonsils and lymph glands, malnutrition and defects of vision (13). Other large scale medical examinations are practically unknown. There is no state insurance or medical service and no complete records are made of military medical tests.

Continuous medical observation of any large section or class of the population is not a procedure, and examinations associated with sick benefit schemes are not carried out by any official or important industrial organisation in China. This implies that disease incidence is not being studied to any extent by this means in China, and similarly disease prevalence, i.e. the disease occurring in a population at a particular time, is also unknown on a national scale.

There are many approaches to the study of morbidity, and as those just discussed - communicable disease records, population group medical records and examination results - did not give a complete picture, there arose the family canvass method of study. As practised in America this consists of periodic visits, usually every two or three months

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over a given period to a selected group of families. Trained social and medical investigators are responsible for making complete records of all the facts associated with sickness experienced by each family. This method has recently been adopted on a vast scale by the United States Public Health Service and is known as the National Health Inventory (14). The application of this method to China is to be seen at Ting Hsien where, in co-operation with the public health officers of the Peiping Union Medical College, a thousand families are being kept under observation (15).

In the above discussion of methods no reference to hospital statistics has been made. As they form the main subject of the present memoir and as hospitals were utilised in the morbidity survey, a full examination of these must be made in the following chapters. However, a brief indication of some of the difficulties and defects in general of morbidity indices is required. A little thought will confirm the view that morbidity or sickness is an extremely vague condition. Even such frank conditions as measles and smallpox will in any given epidemic take the form of both full clinical and subclinical types. These subclinical varieties are in most instances the cases missed through lack of complaint of sickness or absence of well-defined clinical symptoms. In most other conditions also a disease will show all grades of severity. Communicable disease notifications, supported though they are by legislative requirements, must necessarily give an incomplete picture of the prevalence of these diseases.

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Frank cases, subclinical cases and 'carriers' make the whole picture but usually only the frank cases are notified. Questions of adequacy of medical services, extent of appeal to medical practitioners by the population, are other factors influencing reporting of communicable disease.

Medical examination reports suffer even greater deficiencies. Quite apart from variations in definitions of disease and differences in technique and personnel, there arise questions of the object of the examination. If sick benefit or leave are involved, the appeal for examination and diagnosis will differ from those examinations where such considerations do not weigh. Difference of purpose is a most important factor to be accounted for in comparing and using different sets of morbidity examinations.

Differences of technique in examination and in definition of disease remain, however, the greatest flaws in the comparability and evaluation of morbidity data. A diseased tonsil or a thickened artery or practically any other condition has a wide range of meaning to different physicians. This thesis has been carefully examined by Britten (16) who gives striking demonstrations of the slight absolute significance of most morbidity results as a measure of the health of a population but confirms their relative values.

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CHAPTER VI.

THE INITIATION AND DEVELOPMENT OF THE SURVEY.

The Henry Lester Institute of Medical Research, Shanghai, is a British project endowed by the late Henry Lester for furthering medical science in the interests of the Chinese and one of its components is a department of preventive medicine and medical statistics. Being a private organisation it enjoys and suffers the usual characteristics of such bodies. In regard to pure laboratory or clinical investigation conducted within Shanghai no great disability follows the absence of official or Chinese relationships but in field research, especially epidemiology, material is only to be expected on a voluntary or co-operative basis.

The idea of shedding some light on the distribution and prevalence of disease in China had appealed to the Director, Dr. H. G. Earle, as a parallel work to the other activities of the Institute. He approached the London School of Hygiene and Tropical Medicine for assistance in organising a department which, amongst other functions, would undertake such epidemiological studies, and as a result Major P. Granville Edge and the writer proceeded from London to Shanghai in September, 1932. Their arrival coincided with the First General Conference of the Chinese Medical Association, which, following an address by Major Edge, decided on a new research programme. For many years research had been a prominent feature of the Association

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and the new proposals therefore not unexpectedly met with a willing response. These were that it was the duty and responsibility of medical officers in China to put on record in some permanent, usable form their routine experiences in treating patients in their clinics and wards. In many respects this reaction was an outcome of the persistent efforts of Dr. James L. Maxwell, the Editor of the Chinese Medical Journal, to stimulate hospitals to publish annual reports using standard classifications of their medical work.

The resolution adopted by the Association read as follows:-

> "That in view of the support accorded the suggestions relating to the collection of data of the prevalence of disease in China outlined by Major Edge at the general session meeting held on October 4th, this Association heartily supports the proposals for the establishment of a uniform scheme for the carrying out of this useful piece of work, and further, that the Research Council of the Association be invited to provide for the organisation of the simple and practical details which this work will demand."

The Association accepted the offer of Dr. Earle to place the arrangements of this programme in the hands of the new department of the Institute. This was a natural agreement as, on the one hand, it gave the Council for Research machinery to implement their proposals and, on the other, it gave the department a very necessary contact with

conditions/.....

conditions throughout China. The Institute was further strengthened in this relationship by the knowledge that as an immediate and practical means of undertaking morbidity studies the hospitals and their medical officers offered the best solution. The various methods discussed in the previous chapters such as the collection and analysis of fatality records, communicable disease notifications, and family survey data, were either impossible or not easy of approach under the conditions then existing. The only means of securing any general impression of medical conditions throughout China, it was concluded, were through the hospitals as only they provided medical service which reached all areas. At present the majority of the efficient and reliable hospitals are those conducted by missionary organisations. Hospitals were described in a survey conducted by Snell in a report issued by the Chinese Medical Association in 1934 (1) and the following information has largely been obtained from it.

There are approximately 500 hospitals, distributed as mission 60 per cent. and Government and private 40 per cent. Only mission institutions are to be found in all provinces. Mission hospitals have an average of 90 beds each, but many of the private institutions consist of a very small number. Several of the larger mission and Government hospitals have over 200 beds each. Mission hospitals are supplied to a surprising degree with x-ray plants and laboratory facilities, and this is true of the chief Government hospitals.

Hospitals/.....

Hospitals are situated only in urban areas and it is to be stated that the patients visiting them are preponderantly urban dwellers. This means that with existing organisations it is only an account of urban disease conditions which can be given; this is to be regretted inasmuch as 85 per cent. of the Chinese population are agriculturists and rural inhabitants.

In that the hospitals provided the only available means for implementing a national survey it is important to emphasise that the hospital in China differs in many respects from that commonly seen in European countries. Chinese hospitals are almost without exception general institutions and are further not populated by the largely selected type of case seen elsewhere. As the general practitioner, especially undertaking gratuitous service, does not exist outside the hospital all patients who desire modern medical attention must visit the hospital. This implies that the hospitals of China attract a wider class of patient and condition, and as the out-patient or dispensary service is so large a feature, they treat a more truly representative sample of the disease population than would be seen in European or American institutions. This knowledge makes the results of the survey to be described in the following chapters of considerably greater importance than would at first be anticipated.

The proposed morbidity survey, it was accordingly decided, should take the form of the collection of hospital records and medical officers attending the Conference were invited to co-operate. Immediately

following/.....

following the Conference Major Edge left Shanghai on a tour of several of these institutions to secure their full support, and the writer commenced to put into effect the proposed programme.

A circular letter (Appendix 1) on behalf of the Chairman of the Council on Research was sent out to 30 hospitals, selected because of their distribution, importance and representative character. Twenty-seven of these agreed to support the Survey. Meanwhile the simple card and methods to be used for collecting information, the monthly report summaries and the disease nomenclature were prepared.

The Survey commenced on January 1st, 1933, and as was only to be expected extremely variable returns of the cards were at first made. Incomplete or inaccurate returns were received from many hospitals and some hospitals after a few months' participation found it inconvenient or impossible to continue.

At the original discussions a dual purpose had been outlined for the Survey. Firstly there was visualised a scientific object, a study of morbidity prevalence, form and incidence, but secondly, to compensate and justify the co-operation by busy hospitals, it was intended that the Survey records should save the labour and time of their staffs in preparing annual hospital reports. This latter object it was intended to achieve by providing each hospital with a monthly analysis and an annual summary of the cards forwarded by them. These were found to be valuable as an incentive to continue co-operation, but in spite of this assistance it was only by constant appeal and insistence that the Survey continued.

Major Edge returned to England in May, 1933, and the writer became entirely responsible for the organisation. The difficulties of collective voluntary investigation were appreciated and this determined the procedure of constant personal correspondence with the heads of the co-operating hospitals to maintain interest and enthusiasm. In China difficulties of investigation are immense. Hospital staffs are invariably overworked, and the peak of their work coincides with the months of July and August when hot, humid conditions become almost intolerable. It says much for the disinterested enthusiasm and unfailing energy of the hospital superintendents and their staffs that the degree of support accorded the Survey was so high.

During 1933 every opportunity was taken to improve the completeness and accuracy of reporting and when the 1934 arrangements were implemented it was possible to make several satisfactory changes in the methods. Also in 1934 the opportunity of increasing the representation of the hospitals was taken, assisted to some extent by a small sum of money made available by the Executive Council of the Association. This was used to pay certain hospitals small amounts towards the salaries of clerks engaged by them for the clerical work associated with the Survey.

The response to the appeal for either continuation of, or to join, the Survey by the hospitals in 1934

TABLE 1.

HOSPITALS, BY REGIONS, WHICH RETURNED RECORDS OF ALL PATIENTS IN 1933 AND 1934.

Region	1933			1934		
	Hospital	City	Patients	Hospital	City	Patients
South China	Mission	Swatow	10,914	Mission	Swatow	10,074
	General	Canton	9,379	General	Canton	7,263
	C. M. S.	Yunnan	15,299	C.M.S.	Yunnan	17,439
				Hope	Kulangsu	2,083
				Union	Foochow	5,905
			35,592			42,764
Yangtze Region	University	Nanking	18,634	University	Nanking	19,830
	Red Cross	Shanghai	7,987			
	Lester	Shanghai	44,832	Lester	Shanghai	59,039
	General	Nanchang	8,558	General	Nanchang	9,779
	General	Wuhu	5,088	General	Wuhu	6,019
	Kwangchi	Hangchow	18,767	Kwangchi	Hangchow	19,430
	Union	Hankow	7,360	Union	Hankow	9,411
	General	Changteh	5,375			
	Hudson Taylor	Changsha	9,486	Hudson Taylor	Changsha	6,131
	Presbyterian	Hengchow	7,668	Presbyterian	Hengchow	6,364
				Methodist	Hankow	5,352
				Methodist	Teian	2,775
				Bethesda	Siangyang	3,614
				Christian	Suchowfu	14,460
				Methodist	Wusueh	2,325
				Christian	Luchowfu	6,141
			133,755			170,670
North China	Severance	Seoul	17,300			
	Cheloo	Tsinan	12,804	Cheloo	Tsinan	6,687
	Menzies	Hwaiking	2,598	Menzies	Hwaiking	2,273
	St. Paul's	Kweiteh	5,996	St. Paul's	Kweiteh	6,333
				Taylor Memorial	Paotingfu	6,214
				Mackenzie Memorial	Tientsin	26,489
				General	Changte	7,254
			38,698			55,250
TOTAL	17		208,045	25		268,684

was most encouraging. Altogether 17 in 1933 and 25 hospitals in 1934 contributed regular returns of all new cases seen in both their wards and out-patient departments and from Table 1 it will be observed that a fairly satisfactory sample of hospitals both regarding distribution and size was secured (Figure 3).

In addition to those returning full records, there were 11 hospitals in 1933 and 2 hospitals in 1934 which provided partial records of their patients. Wherever a relative picture of disease incidence is required only hospitals of the first group are considered, but in certain aspects the data of the second group have been used.

Many other hospitals could have been included in the second year, in fact a particularly gratifying feature of this year was the number of hospitals which voluntarily offered to ssist the Survey. It was not possible to increase the number owing to the limitations imposed by the expense and staff necessary to conduct the undertaking. The map gives the distributions and, bearing in mind the conditions existing in the interior with large areas in a state of unrest or disturbed by civil war, it will be agreed that this is a fair representation of the available hospitals.

The Survey continued as a function of the department for two years, and at the end of 1934 arrangements were made to hand over the scheme to the National Health Administration as will be discussed in a later chapter.

The records received by the department in Shanghai during the two years from all hospitals reached

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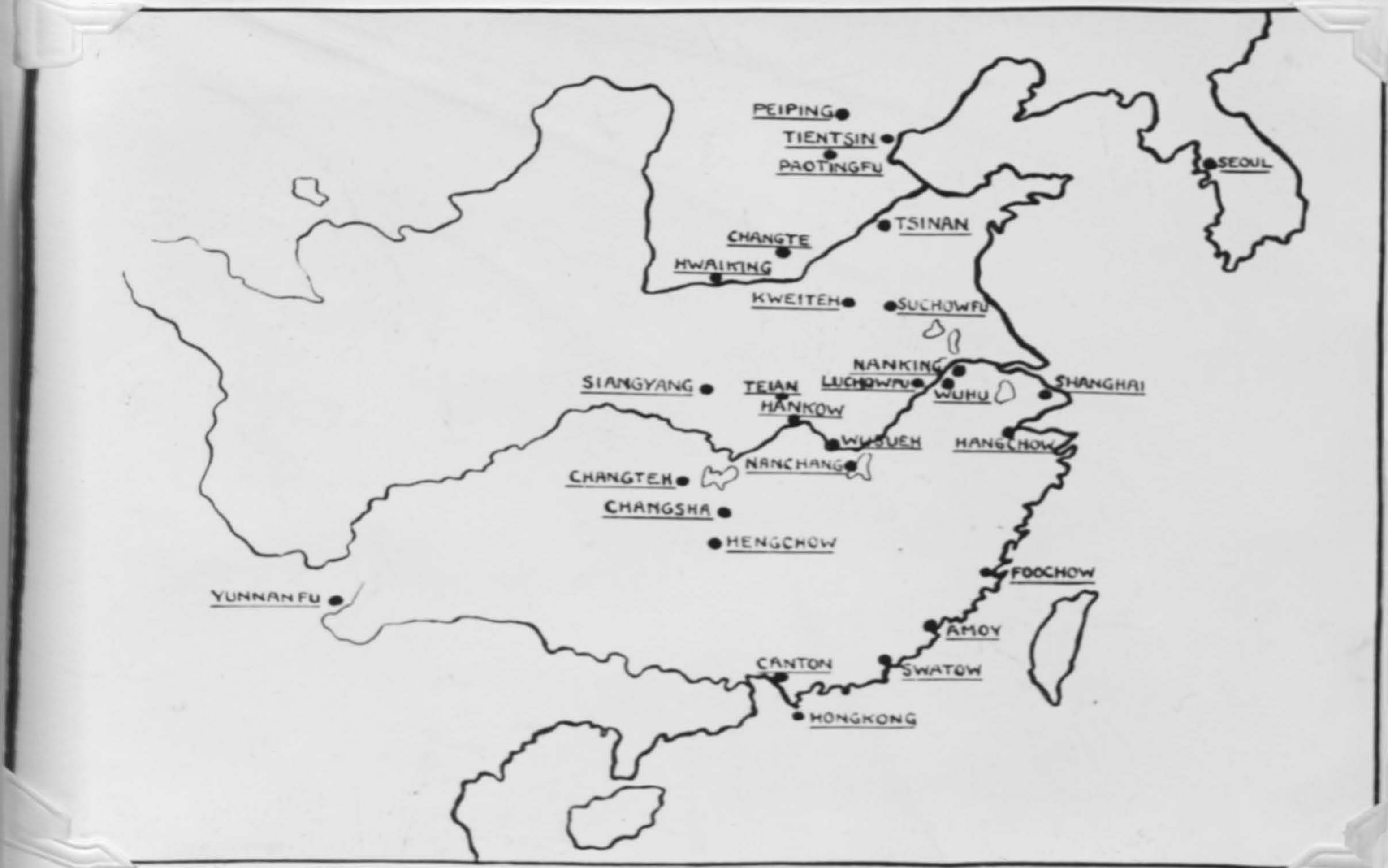

Figure 3. Distribution of Survey Hospitals.

a total of over half a million, and records from hospitals which successfully returned cards of all their patients amounted to 476,729. As a voluntary co-operative investigation in a country not yet highly organised this must claim to be one of the greatest and most highly successful in degree of support yet attempted anywhere.

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1. Snell, John A. "An Enquiry into the Present Efficiency of Hospitals in China with Special Reference to Recent Growth." Chinese Med. Assoc. Special Report Series. No. 1, 1934.

CHAPTER VII.

THE METHODS OF THE SURVEY.

Immediately the Association had adopted the proposal of a morbidity survey being undertaken on its behalf by the Henry Lester Institute, the Department of Preventive Medicine and Medical Statistics proceeded with preparations to enable a commencement to be made on January 1st, 1933.

The first step was the design of a simple card and this, though apparently straightforward, was only settled after much discussion and several trials in the Lester Hospital. In its final form the card was designed to be of post-card size and texture and to be of four different colours to indicate males and females, in-patients and out-patients. This separation of the sexes and types of patients facilitated considerably the counting and sorting of the material, and the device of cutting off one corner enabled correct stacking of cards to be done automatically. The following items of information were required on the card:-

(1) Serial number.
(2) Name of hospital.
(3) Date of admission.
(4) Present domicile.
(5) Past domicile.
(6) Age. Birth month.
(7) Occupation.
(8) Malady.
(9) Remarks.

In the appendices to this memoir are given the card and the pamphlets of instructions issued in connection with the Survey. These pamphlets were:-

(1)/.....

(i) A note on the Survey giving an outline of the methods proposed and which was issued to each hospital invited to co-operate (Appendix 3).

(ii) A list of instructions entitled "Schedule A" issued with the cards to those hospitals agreeing to co-operate (Appendix 4).

For full information on these, the appendices should be consulted, but here it is only necessary to state that the Survey defined its objects as: A record of each new patient seen each month with information to indicate geographical and seasonal distribution, occupation, age and sex incidence, and type of disease. Simplicity and ease of operation had to be secured as the data were to be collected by medical and clerical staffs who, in almost every case, were more than occupied with routine duties. These considerations limited the amount of information obtainable, but the organisers felt that a simple survey was more desirable than a very detailed questionnaire which would soon antagonise already harassed doctors.

The cards were printed and despatched in batches from Shanghai and every month each co-operating hospital returned to the Institute completed sets for analysis. These were examined by the staff of the department, coded for disease classification and the ages converted into Western standards by the method devised by the writer and given in Appendix 5.

The preparation of a disease classification presented considerable difficulties. Many factors

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by the coding used in the short list of the Survey is seen to be included in the title 31 - "Diseases of the Ear and Mastoid Sinus". The relationship of the International Manual titles and the Survey list titles will be clear on consulting Appendix 6.

Having the Manual as the arbitrator of the classification of diagnoses facilitated the work enormously. The technicians were not obliged to possess medical knowledge but used the index to guide them in choice of disease titles. Nevertheless, before the Survey proper commenced the staff of four technicians was trained in the various methods, viz:-

(1) Stacking and sorting cards into sex and hospital groupings;

(2) converting age data;

(3) learning the short disease list and classifying diagnoses by a system of coding.

Eventually this work became extremely mechanical and accurate, and, even including methods of checking and cross-checking, over a thousand cards a day could be handled with ease.

Thus far have been described the recording, collection and classification of the data, and there remain for discussion only the methods of reporting the results of analyses. As indicated in the previous chapter two objectives were visualised:-

(1) Assisting hospitals to prepare their own records.

(2) Analysing the data for epidemiological purposes.

To/.....

had to be taken into account. Firstly, diagnoses were being recorded on the cards by a great number of doctors differing in their methods, their use of terminology, and in their degree of exactness of diagnosis. Secondly, many problems had to be solved concerning the type of case to be recorded, new or return case, the selection of diagnoses, primary or secondary, etc. Thirdly, morbidity terminology and nomenclature which are by nature vague, have never yet received standardised definitions and classifications. Finally, the vagaries of the staff analysing the records had to be met and overcome as different individuals not only record facts differently, but give different rulings on classifying facts already recorded unless given a fixed procedure. These personal equations were intensified by the fact that the technical staff entrusted with classification and coding were young Chinese of only middle-school education and no knowledge of medical and pathological terms. All these facts demanded the construction of a system to give standard classification and uniform interpretation of the multitudinous terms and words used by doctors in diagnosing disease.

This problem of coding and classifying was also approached by the trial and error method. Through the courtesy of Dr. J. L. Paterson the routine record cards of the Lester Hospital were obtained and various disease classifications were drawn up and then tried out with this material. Numerous annual hospital reports were also consulted. Eventually it was resolved to base the morbidity list

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on the International List adopted by the International Commission for the Classification of Causes of Death, Paris, 1929 (1).

By compressing the International List Manual giving this classification a short disease list of 50 titles was compiled suitable for the conditions of the Survey. A long, detailed list was considered impracticable as diagnoses were in many cases too broad to allow of exact qualification. Being based on the Manual had several advantages. Any observer of the Survey results is able to assess exactly the definition and inclusive nature of each disease title by reference to the Manual. This implies that the Survey results are displayed in a form comparable with other morbidity studies. For instance, "Rheumatic Conditions" may be a very vague group and unless a standard has been used no comparisons can be made from one to another set of data. In this case "Rheumatic Conditions" can be defined by reference to the Manual of the International List referred to above.

This is one aspect of the use of a short list based on the Manual, but another, equally important, relates to the classification and entry of the diagnoses recorded on the card. A technician coding the cards by using the Manual is enabled to classify with confidence the vast majority of diagnoses, however vague. This is done through the very comprehensive index appended. An example will make this clearer. The technician sees the diagnosis "Otitis media" and turning up these words in the index is directed to the number 89. This number

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To secure these, various procedures had to be evolved.

In the first case the monthly return of cards was arranged, as only in a regular collection spread over the year could it be hoped to analyse the enormous mass of data sufficiently rapidly to be of the current interest demanded of annual hospital reports. Similarly the limited machinery at the disposal of the department necessitated the work being spread over in order to secure its completion at all. In such a regular contact with the co-operating institutions lay, too, the only check of progress. Every month the returns of each institution were examined to assess their completeness and accuracy and any defects were thus capable of early correction. Had a whole year elapsed before any judgment was possible of the progress of the work, many hospital returns would have been of little value and few opportunities for directing, guiding and stimulating co-operation would have occurred. Much of the success of co-operation achieved depended upon the opportunity given each month of communicating with each hospital and discussing defects and methods for improving the recording of data.

Each month therefore required an analysis of each hospital's returns. These analyses were recorded on the summary disease list known as "Schedule C" and given in the appendix. This displayed the returns by age groups -

0 - years.
1 - "
5 - "
15 - "
25 - "
35 - "
45 - "
55 and over.
Age unknown.

for each sex and each of the fifty disease titles. One copy was forwarded to the hospital concerned

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and another copy filed for use in analysing the results of the whole Survey.

The short disease list it will be now appreciated enabled the extremely important procedure of uniform classification by age and disease for each sex to be secured. The whole material, whatever the origin or nature of its individual parts, was being analysed on a uniform basis and was giving a direct measure of comparison from region to region, month to month, and also rendering possible comparisons with material amassed in other countries. This principle of uniformity in recording, analysing and reporting the Survey results is one of the fundamental contributions the Survey claims to make towards morbidity investigation in China.

In the following chapters are given such results as were obtainable before the writer left Shanghai. Much material remains for analysis, and some of the present subjects still provide scope for treatment. Owing to certain differences in the returns and the varying degrees of promptness with which they were forwarded, certain variations in the material and in the fullness with which examination was possible from chapter to chapter have been unavoidable.

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1. Manual. International List of Causes of Death. H.M.S.O., London. 1931.

CHAPTER VIII.

AGE, SEX AND MONTHLY DISTRIBUTION.

A. 1933 Records.

Statistical and epidemiological investigation has demonstrated clearly the importance of sex and age as factors influencing disease. In each age period certain types and varieties of disease are most prevalent or important as causes of morbidity and mortality. A population of the younger ages will show, for example, a higher incidence of the acute infectious diseases and a lower incidence of tumours and circulatory conditions than a population with a larger proportion of elders. Similarly the proportion of the sexes in any given population will affect the incidence of disease conditions. Comparisons, therefore, of the incidence of different diseases in different hospitals or countries cannot justifiably be made unless the factors of age and sex are considered and their effects estimated.

The Sex Constitution.

As a vital statistical record of the Chinese people either by provinces or nationally has yet to be made, no complete knowledge exists of the sex ratio and its variation throughout China. However, several studies have been undertaken on various samples of the population in different areas which have been collected in the report issued by the Directorate of Statistics (1). The sex ratio in this list varies from 103.7 reported by Li Chin-han for Peiping to 119.0 given by Chiao

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for an area in Shansi, and the total studies combined give a figure of 111.7 males to 100 females. Rural studies of the sex ratio are those of Buck (2) and Chiao (3) giving ratios of 105.7 and 109 respectively. As urban areas provided the data for the hospital survey it is of interest to note that the government publication quoted above (1) gives a ratio of 114.6 males to 100 females on a basis of a survey of six large cities. This ratio, though high, still leaves as remarkable the fact that in 1933 in the hospital population under discussion roughly two males sought treatment for every female. The figures for the different areas are:-

South China	132 male patients to 100 female.
Yangtze Region	244 male patients to 100 female.
North China	251 male patients to 100 female.

The sex ratio of Mayo Clinic patients (4) as determined by considering the admissions for one year was found to be 104 males to 100 females, a condition similar to the sex ratio of the population as a whole.

The explanation of the male preponderance in the present group depends upon many features of Chinese life and customs. In the old Chinese social system woman is inferior to man, she is restricted to the home and in every way her welfare and health are of less concern than that of the male. Also, although amongst the lower classes the Chinese woman leads as active a working life as the man, she on the whole probably resembles her sister elsewhere in being less prone to causes of morbidity

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than the man.

Yuan (5) has made interesting observations on the vital statistics of the urban area under the control of the Peiping Health Station which have a bearing on the question of sex ratio in China. The preponderance of males in this area is associated with an unusual age distribution due to large numbers of young adult and middle-aged males, while the female age distribution resembles the normal age curve which slopes downwards with the older ages. He goes on to say: "Such sex disproportion and great concentration of young adult and middle-aged males in the city is a reflection of the extremely poor economic condition in this country where the men come to work in the city and a large proportion of them are unable to bring their families to live there. This explanation is supported by the great discrepancy of the age and sex distribution of the population as classified by residential and non-residential premises. The population living on residential premises is composed of 55 per cent. males and 45 per cent. females, while the sex distribution of the people living in the non-residential premises is 93 per cent. males, and 7 per cent. females. Of the 93 per cent. males, the majority are young adult and middle-aged people and this can practically account for the abnormal age curve of the population." As the hospitals under consideration are situated in urban areas, it may be concluded that this factor of an unequal proportion of the sexes in the populations they serve explains to a great extent

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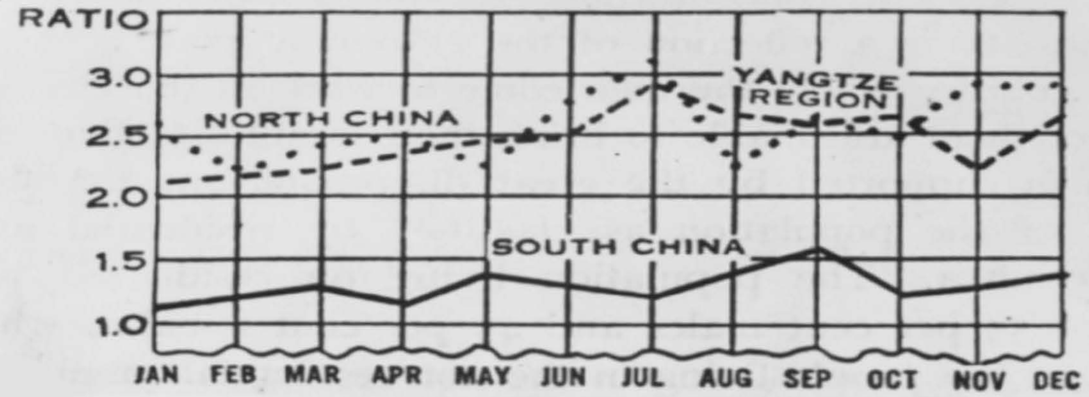

Figure 4. Sex ratio in hospitals of South China, Yangtze Region and North China.

the sex ratio of two males to one female seeking hospital treatment.

The staff and constitution of hospitals play some selective part in the sex constitution of their populations. Women physicians, female nurses, departments of obstetrics and gynaecology, and maternity and child clinics attract the attendance of female patients. Bearing these considerations in mind it is noteworthy that the ratio of males to females is distinctly lower in South China (132) than in the Yangtze Region (244) and North China (251).

All three regions show approximately the same seasonal changes in the sex ratio (Table 2 and Figure 4). In January to February, in mid-winter, the ratio is the lowest in each area, while with the onset of summer the ratio rises, reaching its maximum in September in South China (1.56:1) and in July both in the Yangtze Region (2.78:1) and in North China (3.09:1). The significance of this fact is debatable. It may be that heat and summer diseases affect males more than females or that women are less likely to be hindered by cold and winter conditions from seeking hospital treatment. Further, it must not be overlooked that the sex constitution of the population of the districts served by the hospitals may alter seasonally. All the Survey hospitals are in urban areas and summer probably brings crowds of men into the cities and produces those activitie and movements exposing individuals to injury and disease.

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TABLE 2 : MONTHLY SEX DISTRIBUTION OF PATIENTS BY REGIONS.

Hospitals		January	February	March	April	May	June	July	August	September	October	November	December	Total
South China	Male	1,479	1,767	2,303	1,936	2,358	2,454	2,171	2,304	2,379	2,036	1,753	1,683	24,623
	Female	1,274	1,506	1,706	1,642	1,667	1,804	1,658	1,646	1,522	1,606	1,357	1,246	18,634
	Ratio M:F	1.16	1.17	1.35	1.18	1.41	1.36	1.31	1.40	1.56	1.27	1.29	1.35	1.32
Yangtze Region	Male	3,635	5,231	7,313	7,189	8,760	7,388	9,069	10,647	9,196	7,906	6,460	6,613	89,407
	Female	1,806	2,508	3,308	3,126	3,602	2,993	3,268	4,027	3,645	3,052	2,767	2,578	36,680
	Ratio M:F	2.01	2.09	2.21	2.30	2.43	2.47	2.78	2.64	2.52	2.59	2.33	2.57	2.44
North China	Male	823	1,195	1,781	1,864	1,891	1,530	1,360	1,341	915	819	982	794	15,295
	Female	326	556	739	756	818	578	440	593	358	328	343	268	6,103
	Ratio M:F	2.52	2.15	2.41	2.47	2.31	2.65	3.09	2.26	2.56	2.50	2.86	2.96	2.51
Total Hospitals	Male	5,937	8,193	11,397	10989	13,009	11,372	12,600	14,292	12,490	10,761	9,195	9,090	129,325
	Female	3,406	4,570	5,753	5,524	6,087	5,375	5,366	6,266	5,525	4,986	4,467	4,092	61,417
	Ratio M:F	1.74	1.79	1.98	1.99	2.14	2.12	2.35	2.28	2.26	2.16	2.06	2.22	2.11

The seasonal feature in the sex ratio in the Mayo Clinic (4) was the increase of male admissions with the arrival of winter, while women tended to seek treatment in summer, a state of affairs the exact reverse of the Chinese hospital populations.

Age Constitution.

Age has been given throughout this memoir in terms of the Western calendar, conversion having been performed by the modification of Stevenson's method (6) described in Appendix 5. The percentage age distribution as shown in Table 3 and Figure 5 indicates that in all three regions in both male and female the greatest numbers occur in the age groups 15-24 and 25-34 years with decreasing numbers in the older periods. Stated in other words it is demonstrated that in the Survey hospitals the greatest number of patients are to be classed as adolescents and young middle-aged, these forming 59.9 per cent. of all male patients and 48.2 per cent. of all female patients.

Interesting age group differences are displayed when the sexes are compared. Infants under one year form 2.8 per cent. of all male admissions but over 5.8 per cent. of all female admissions. This ratio of one male patient to two female patients in the total hospital series is repeated in the next age group, 1-4 years, where the male percentage is 7.5 and the female 16.0. It is only when ages of over 15 years are reached that the males predominate. Yuan's demonstration of urban preponderance of young adult and middle-aged males in the Peiping Health Area is largely explanatory of the sex

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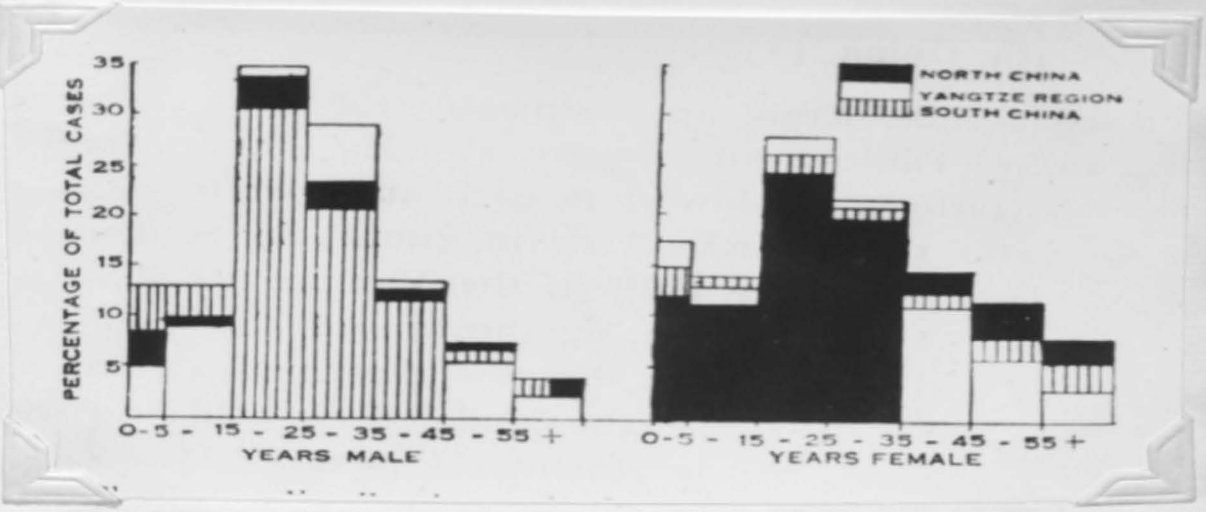

Figure 5. The age distribution of the hospital populations in the three regions: North China, Yangtze Region and South China.

TABLE 3 : PERCENTAGE AGE DISTRIBUTION OF HOSPITAL POPULATIONS COMPARED WITH CHINESE RURAL POPULATION GROUP, PEIPING HEALTH AREA POPULATION AND MAYO CLINIC POPULATION.

Age Group	Hospital Population								Chinese Rural Population		Peiping Health District		Mayo Clinic	
	South China		Yangtze Region		North China		Total Hospitals							
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
0 -	5.2	6.0	2.1	6.0	2.8	4.5	2.8	5.8	3.3	3.1	-	-	-	-
1 - 4	7.9	9.0	3.8	11.3	4.6	7.5	4.7	10.2	10.2	10.4	-	-	-	-
0 - 4	13.1	15.0	5.9	17.3	7.4	12.0	7.5	16.0	13.5	13.5	6.1	10.1	2.52	2.32
5 -	13.1	13.5	8.8	13.3	9.9	11.3	9.8	13.2	22.8	20.5	12.6	17.9	3.89	3.97
15 -	30.3	26.3	34.8	28.5	34.0	24.0	33.8	27.3	18.3	17.7	25.4	17.2	8.89	11.63
25 -	20.2	20.2	28.2	21.3	23.8	19.8	26.1	20.9	15.3	15.2	19.4	17.0	19.72	24.02
35 -	12.1	12.2	13.9	10.5	13.2	14.0	13.5	11.4	12.5	12.3	18.1	16.0	23.72	23.89
45 -	7.2	7.8	6.0	5.6	7.5	11.8	6.4	6.9	9.4	9.5	11.8	11.5	19.33	19.21
55 +	4.1	5.1	2.5	3.5	4.1	7.5	3.0	4.4	8.1	10.8	7.3	10.4	21.84	14.98
	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Total Patients	24,529	18,560	88,359	36,225	15,235	6,073	128,123	60,858	35,262	32,381	36,655	20,217	12,931	12,412

differences noted in the present hospital populations (5). When the three regions are compared further facts about the age distribution are to be observed. Considering the males first, it is seen (Figure 5) that South China has a larger proportion of patients in the 0-4 and the 5-9 age groups than either the Yangtze Region or North China, while in the three age groups 15-24, 25-34 and 35-45, South China has the smallest percentage of the three regions. Chiao, in his rural population studies (3), states that North China in the ages 5-39 has a smaller percentage than South China, but that over the age of 39 North China has a higher percentage which is roughly the reverse of the hospital age distribution in these areas. The explanation probably lies to some extent in the fact that the cities drain the rural areas of adult males to a different degree in different regions.

The significance of the age distribution of hospital patients is appreciated by a comparison with the age distribution of the population the hospitals serve. As yet few studies of age distribution have been undertaken in China, but two of the most satisfactory are those of Chiao (3) for rural populations and Yuan (5) for an urban population, and these are used here (Table 3 and Figure 6).

The graph demonstrates that the rural population has a normal age distribution for males with the highest proportions at the younger ages, but that both the Peiping area and the hospitals have populations with the largest proportions in the young adult and middle-aged groups. In the age groups

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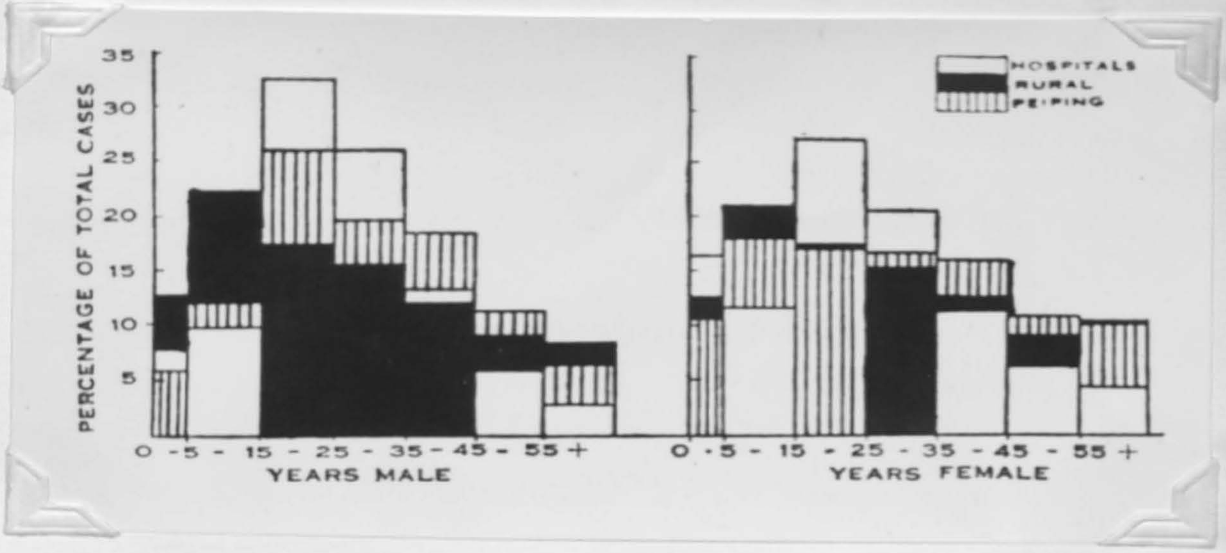

Figure 6. The age distribution of total hospital populations compared with a rural population and the Peiping Health Area population.

over 45 years, however, the hospitals have smaller percentages than either the urban or rural groups. Examination of the graph demonstrates one interesting difference of the female grouping from that of the male. In the 0-4 age group of the males the proportion is smaller in the hospitals than in the rural area, though in the females it is a larger proportion, but in the other age groups the female hospital patients have an approximately similar relationship to the rural and urban populations as the male.

In general terms, the large proportion of males and females in the young adult and young middle-aged group of the hospital populations is related in some degree to the fact that populations of urban areas in China have a similar disproportionate age distribution, accepting the application to all the urban areas concerned of Yuan's findings in Peiping. Thus, from an examination of the age distribution of the hospital populations alone it would be making an unwarranted deduction to say that the large numbers in these particular age groups were due wholly to a greater susceptibility to causes of morbidity.

The dependence of the age constitution of hospital populations on this factor in the communities they serve having been discussed, the interesting question arises as to how far disease populations in different countries correspond. It is unfortunate that few studies have been made of the age and sex distribution of hospital patients and Alvarez and Ascanio mention that not even in the leading

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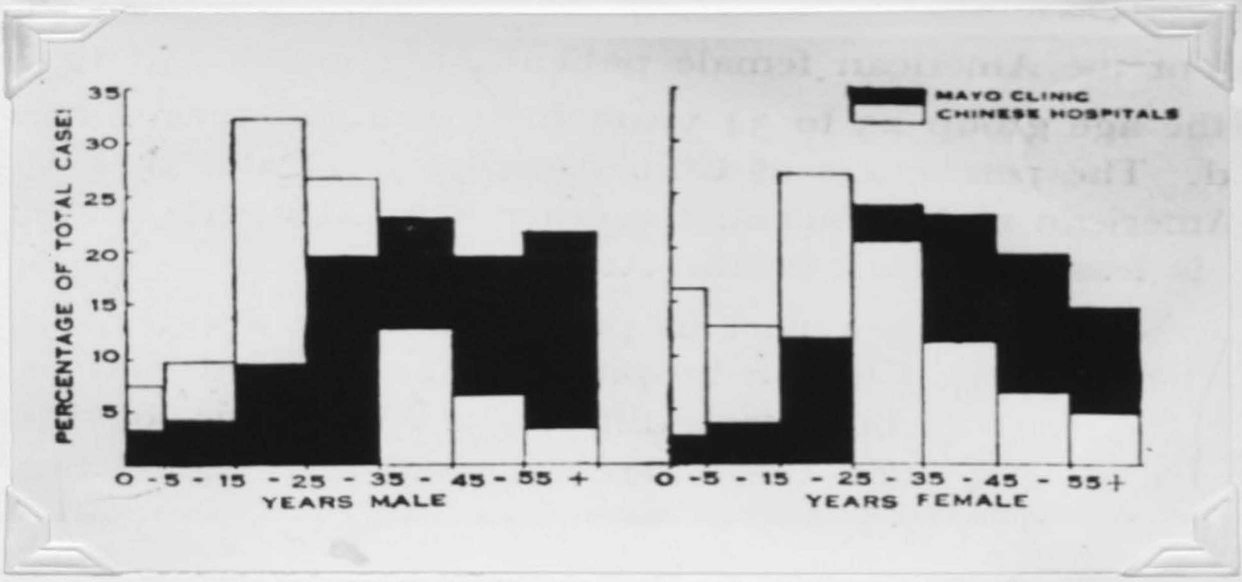

Figure 7. The age distribution of Chinese hospital populations compared with a Mayo Clinic population.

medical centres of the United States is such information available. The only example which it has been possible to obtain is that of the Mayo Clinic analysed by the above authors (4) and which is compared with the present Chinese group in Table 3 and Figure 7.

The differences are obvious, indeed remarkable. The greatest number of Chinese male patients are young men from 15 to 34 years of age, while the greatest number of Mayo Clinic male patients are middle-aged and old men. Over 75 per cent. of the Chinese male patients, but only 35 per cent. of the American male group, are under 35 years of age. Similarly over 75 per cent. of the Chinese female patients, but only 42 per cent. of the American female patients, are under 35 years of age.

In the age group 25-34 years there is a difference in the sexes to be noted. The percentage of Chinese males is greater than the percentage of American males, but on the other hand the percentage of Chinese females is less than that of the American.

Many factors play a part in producing these age constitutional differences between the Chinese hospital population and that of the Mayo Clinic. Different birth rates, different expectations of life, different causes of morbidity, and the different appeal for medical treatment and advice all influence the age make-up of the two national populations. It is interesting to speculate on these and other influences, but until vital and medical statistical knowledge is more complete such speculation must be largely fruitless. Whatever

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the causes, the striking dissimilarity of the age constitution of the two hospital populations is sufficient argument of its importance in all questions of variations in disease incidence in different races and in different areas. For instance, in the present case it is to be expected that those diseases to which infants, children and adolescents are prone will be more evident in the hospitals of China than in the Mayo Clinic, but only on the elimination of age distribution differences can it be decided that young Chinese are more liable to suffer from such diseases than young Americans. Again the number of old Chinese seen in hospitals is proportionately much smaller than is the number of Americans and therefore a physician claiming purely on the basis of hospital experience that conditions such as arteriosclerosis or chronic nephritis are more rare in the Chinese race is making unwarranted deductions. Only when analyses of disease populations, including such factors as age and sex, have been more generally undertaken can answers be given to questions of racial and regional differences in susceptibility to causes of disease.

B. 1934 Records.

It was found impossible to examine in detail the results of the 1934 survey, but in the following paragraphs the more important features are indicated and certain comparisons made with the 1933 analysis.

<u>The sex constitution</u>: The results for the two years are as follows:-

Hospitals.	No. of males to 100 females.	
	1933	1934
South China	132	118
Yangtze Region	244	228
North China	251	337
Total Hospitals	211	219

Both years show approximately the same ratio of males to females, and further, the same increase of the ratio on proceeding from South China to North China. The repetition of the same sex constitution by a larger group of patients and an increased number of hospitals adds support to the view previously expressed that male preponderance in the patients of Chinese hospitals is to be ascribed not only to the lack of social freedom of womankind, but also to the unequal proportion of males in the urban communities which supply the hospital populations.

The regional difference in the sex ratio is a curious phenomenon and explanations of why North China has a higher ratio than South China can only be surmised. That South China is more progressive and enlightened is a generalisation which is roughly true. It is also less poverty-stricken in its rural areas. The one factor would lead to women being less restricted in seeking Western medical treatment, and the second would lead to a greater proportion of males seeking

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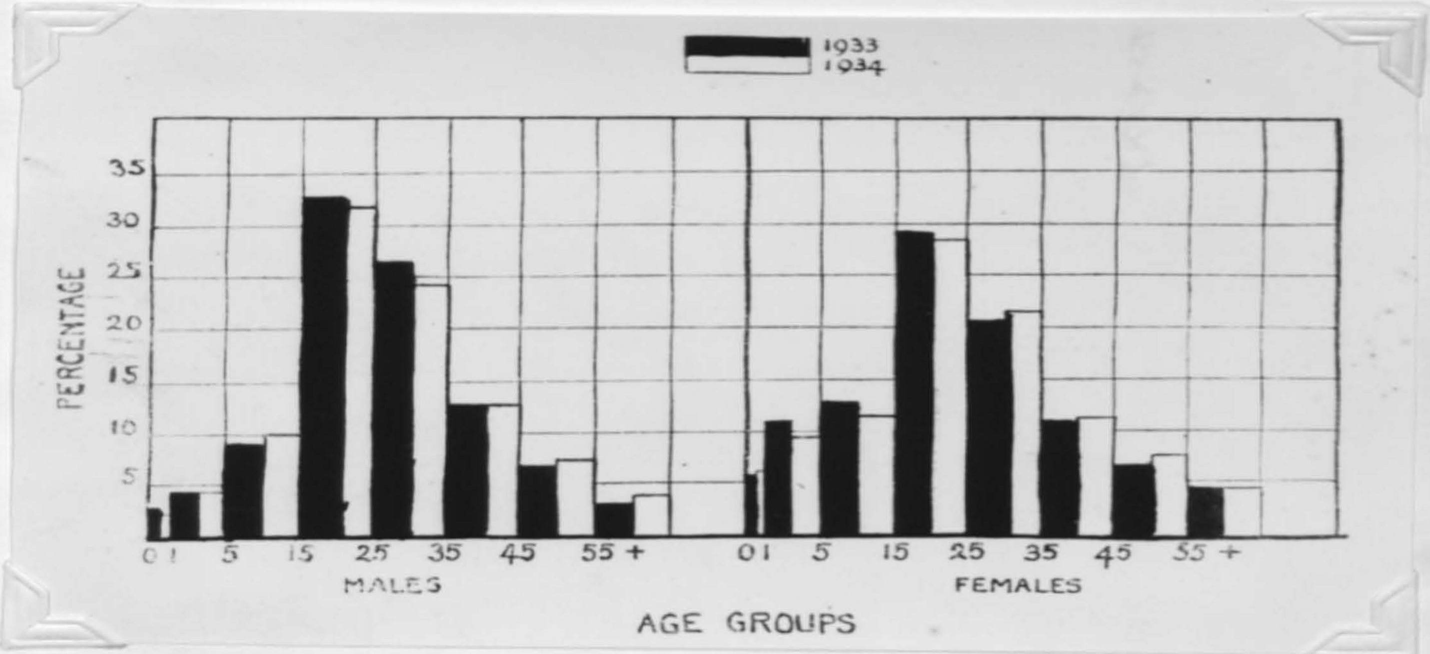

Figure 8. The age distribution by sex for 1933 and 1934.

TABLE 4 : PERCENTAGE AGE DISTRIBUTION OF HOSPITAL POPULATIONS FOR 1933 AND 1934.

Age Group	South China				Yangtze Region				North China				Total Hospitals			
	Males		Females		Males		Females		Males		Females		Males		Females	
	1933	1934	1933	1934	1933	1934	1933	1934	1933	1934	1933	1934	1933	1934	1933	1934
0 -	5.2	6.3	6.0	5.5	2.1	2.4	6.0	6.4	2.8	1.5	4.5	4.5	2.8	2.6	5.8	5.9
1 -	7.9	8.9	9.0	8.2	3.8	4.4	11.3	10.5	4.6	3.3	7.5	7.5	4.7	4.7	10.2	9.5
5 -	13.1	12.9	13.5	12.6	8.8	9.6	13.3	12.1	9.9	9.3	11.3	12.5	9.8	10.0	13.2	12.3
15 -	30.3	29.2	26.3	27.6	34.8	33.6	28.5	28.3	34.0	34.8	24.0	21.4	33.8	33.3	27.3	27.1
25 -	20.2	20.5	20.2	21.0	28.2	27.2	21.3	21.8	23.8	24.6	19.8	20.0	26.1	25.7	20.9	21.4
35 -	12.1	11.5	12.2	12.3	13.9	13.7	10.5	11.2	13.2	13.8	14.0	14.2	13.5	13.5	11.4	11.9
45 -	7.2	6.8	7.8	7.4	6.0	6.3	5.6	6.0	7.5	8.6	11.8	12.6	6.4	6.9	6.9	7.3
55 +	4.1	4.0	5.1	5.3	2.5	2.8	3.5	3.7	4.1	4.2	7.5	6.9	3.0	3.3	4.4	4.5
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Total Patients	24,529	23,025	18,560	19,496	88,359	117,592	36,225	51,515	15,235	42,514	6,073	12,367	128,123	183,131	60,858	83,378

employment in northern towns than in southern towns, thus raising the male ratio in northern communities.

<u>Age constitution</u>: The age groups for both males and females by regions are given in Table 4 and Figure 8. Each category shows that the 1934 figures are similar to the 1933 results to a truly remarkable degree. The 1933 findings therefore require no modification. Both years display the same interesting difference of the male and female age distribution. A greater proportion of the female patients occurs in the first two age groups, 0-1 years and 1-4 years, than of the male patients. Taking the total hospital figures, females provide 5.8 per cent. and 5.9 per cent. for 1933 and 1934 respectively in the youngest age group, while the corresponding male figures are 2.8 per cent. and 2.6 per cent. In the next group 1-4 years, the difference is equally striking, the female figures for the two years being 10.2 per cent. and 9.5 per cent. and the male 4.7 per cent. for both years.

The higher proportion of females in the younger age group is balanced by the greater percentage of males occurring in the age groups 15-24 years and 25-34 years.

When this phenomenon of the different age proportions of the sexes is considered in connection with the three regions, it is found that the Yangtze Region and North China show the higher proportion

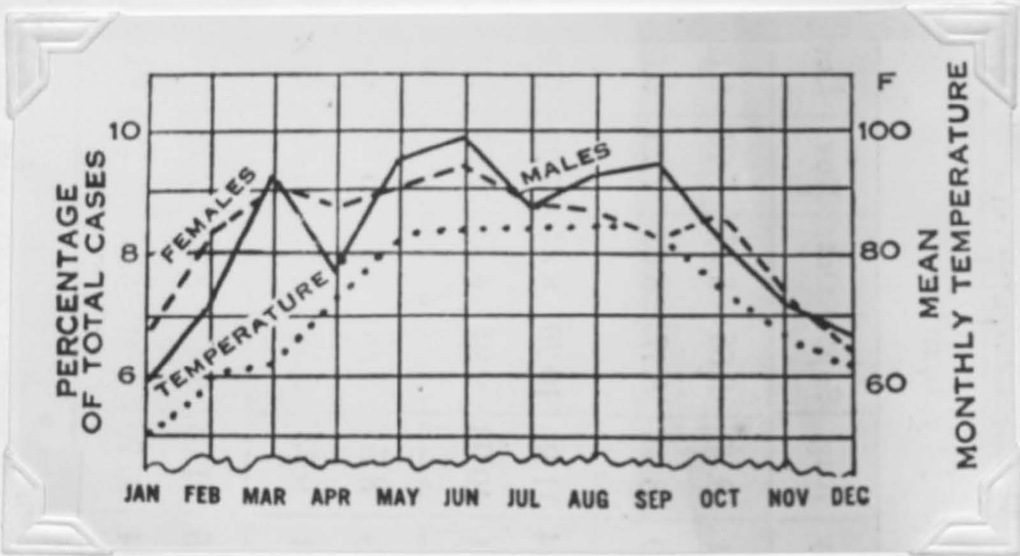

Figure 9. The monthly distribution of male and female cases in South China hospitals with the monthly mean temperatures for Canton, 1933.

Monthly Distribution of Cases.

In Table 5 the distribution of male and female patients is given by months for each region. The monthly figures represent the percentage of the total cases of the year seen in each month, these totals being given in the last column. The largest number of patients are those from the nine hospitals in the Yangtze Region, while the three hospitals of North China give the smallest group of patients:

	Males.	Females.	Total.
South China	24,623	18,634	43,257
Yangtze Region	89,407	36,680	126,087
North China	15,294	6,104	21,398
Total	129,324	61,418	190,742

In Figures 9, 10 and 11 the monthly percentages of male and female cases of the yearly totals for each region have been plotted and the corresponding monthly mean temperature of meteorological stations in the same areas given (7).

South China - Figure 9: The curves of male and female percentage monthly distributions are roughly similar, the peaks of both occurring in June with 9.96 per cent. and 9.69 per cent. respectively, while the month with the lowest number of patients seeking treatment was January with 6.00 per cent. in the case of the males, and December with 6.69 per cent. in the case of the females. The general appearance of the curves

TABLE 5 : MONTHLY DISTRIBUTION OF HOSPITAL PATIENTS BY REGIONS.

Hospital		Per Cent. Distribution of Cases by Months												Total Cases
		January	February	March	April	May	June	July	August	September	October	November	December	
South China	Male	6.00	7.17	9.35	7.86	9.57	9.96	8.81	9.35	9.66	8.27	7.12	6.83	24,623
	Female	6.84	8.09	9.16	8.82	8.95	9.69	8.90	8.84	8.17	8.62	7.29	6.69	18,634
Yangtze Region	Male	4.07	5.85	8.18	8.04	9.80	8.26	10.14	11.91	10.29	8.84	7.23	7.40	89,407
	Female	4.92	6.84	9.02	8.52	9.82	8.16	8.91	10.98	9.94	8.32	7.54	7.03	36,680
North China	Male	5.38	7.81	11.65	12.19	12.36	10.00	8.89	8.76	5.98	5.36	6.42	5.19	15,295
	Female	5.34	9.11	12.11	12.39	13.40	9.41	7.21	9.73	5.87	5.37	5.62	4.39	6,103
Total Hospitals	Male	4.59	6.34	8.82	8.50	10.07	8.80	9.75	11.06	9.67	8.33	7.12	7.03	129,325
	Female	5.55	7.44	9.37	8.99	9.91	8.75	8.74	10.20	9.00	8.12	7.27	6.66	61,417

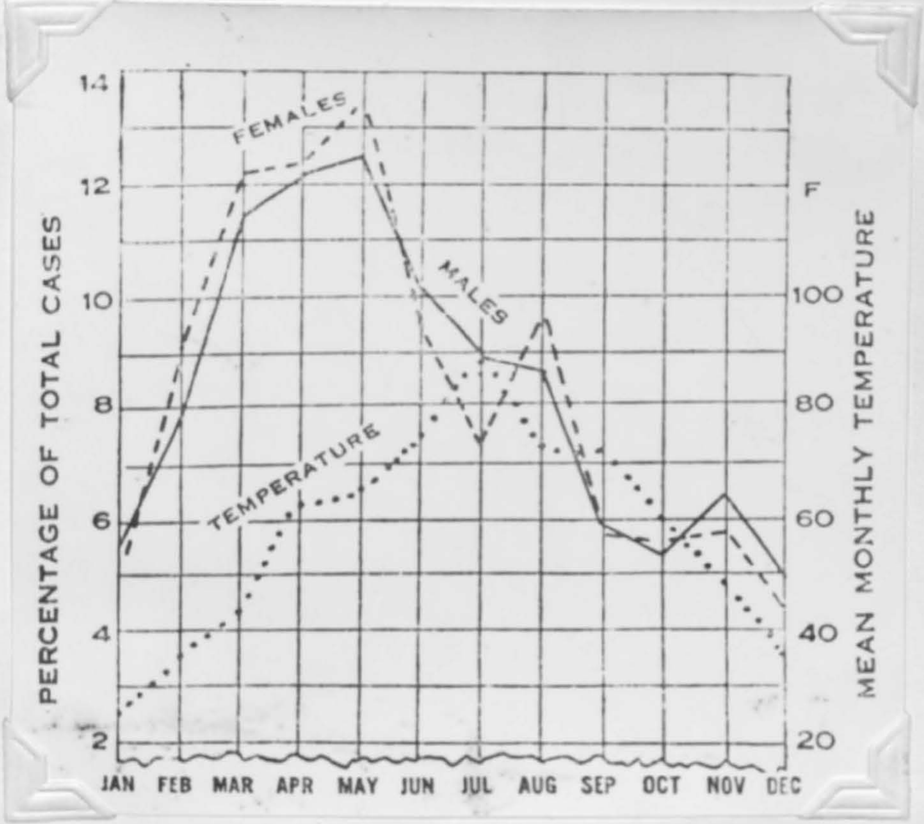

Figure 11. The monthly distribution of male and female cases in North China hospitals with the monthly mean temperatures for Tongku, 1933.

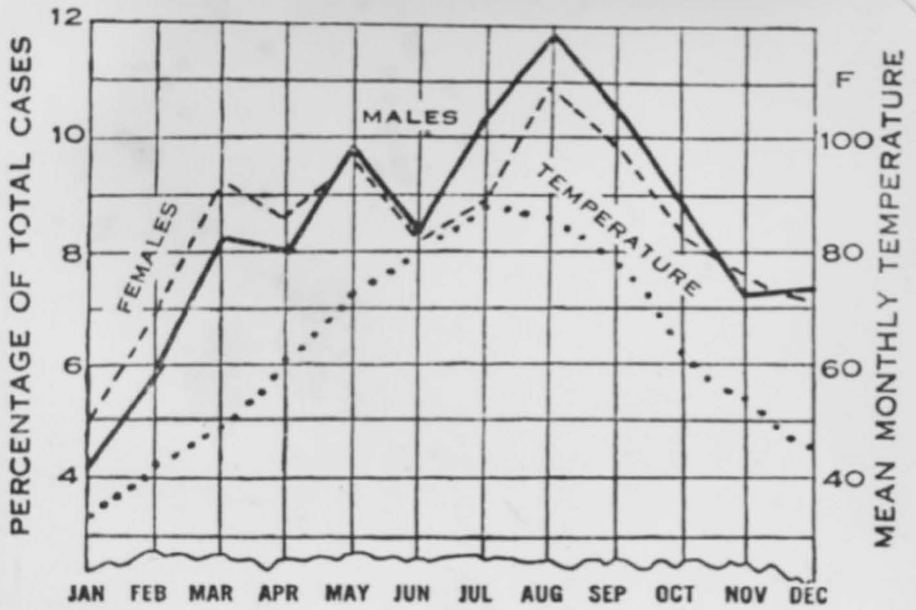

Figure 10. The monthly distribution of male and female cases in Yangtze Region hospitals with the monthly mean temperatures for Hankow, 1933.

at Canton. The peak of the case admissions was June, but the highest mean temperatures (83.7° F.) were July and August. South China being either within or adjacent to the tropics possesses a general climate lacking marked winter and summer temperature fluctuations, and hot and humid conditions characteristically extend from May to September.

<u>Yangtze Region - Figure 10</u>: The valley of the Yangtze River has a moderately cold winter accompanied by frosts, but an extremely hot, humid summer usually of two to three months' duration, with its maximum intensity in July and August. The mean monthly temperature curve at Hankow may be taken as characteristic of the region. January and February had in 1933 the lowest mean temperatures, 32.6° and 43.1° F., respectively and the maximum mean temperature of 87.1° was reached in July, while August gave a reading of 86.7° F. The temperature curve is thus more elevated than that of South China and this feature is repeated by the curves of the percentage distribution of male and female patients. These two curves follow each other closely. Cases are lowest in January, increase in February and March, show a slight downward trend in April followed by a rise in May and a fall in June, but then show a definite upward trend to reach a peak in August. After August both curves fall away rapidly. Generally the admission of cases in the hospitals of the Yangtze Region followed the mean monthly temperature curve, but the peak occurred in August - male 11.81 per cent.,

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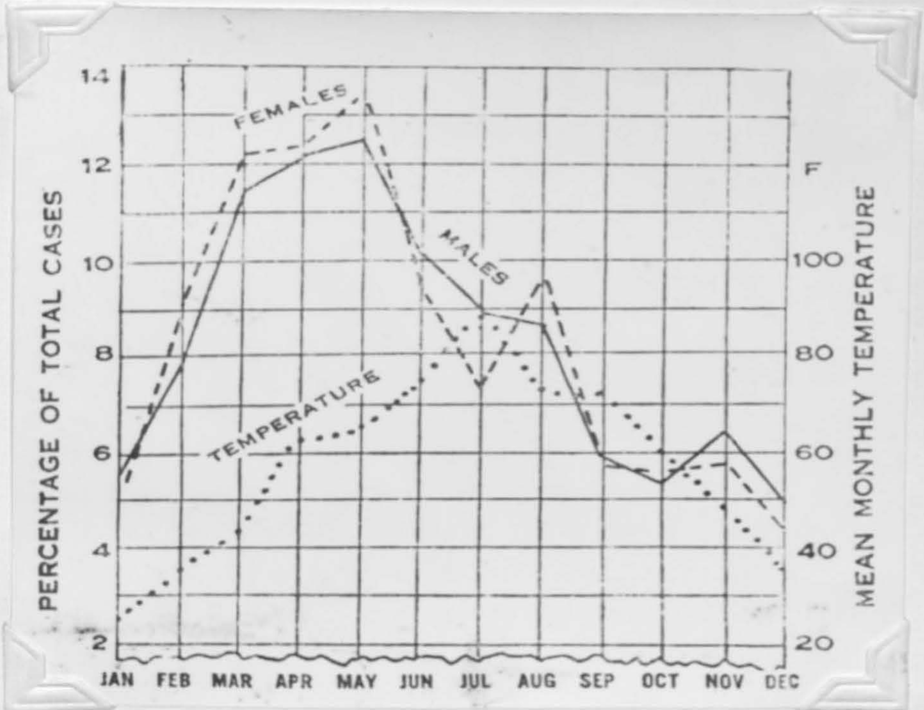

Figure 11. The monthly distribution of male and female cases in North China hospitals with the monthly mean temperatures for Tongku, 1933.

females 10.98 per cent. as against the maximum temperature being recorded in July. July, August and September are thus the months in these hospitals when admissions are highest and when climatic conditions are extremely trying owing to the combination of high temperature and humidity.

North China - Figure 11: Cressey (8) concerning the North China climatic type states: "In this region the mean temperature of November is below 10, but above $0^{o}C.$, and the mean annual above $10^{o}C.$, while the annual range of temperature amounts to $25-35^{o}$. The rainfall maximum occurs in the month of July, and the winter is quite dry. The annual precipitation varies greatly from year to year in this part of the country."

The cold dry winter and hot summer are reflected in the mean monthly temperature curve of Tongku given in Figure 11, with a minimum mean monthly temperature of $25.7^{o}F.$ in January and a maximum mean monthly temperature of $88.7^{o}F.$ in July. Only three hospitals are grouped in the North China region and the total number of patients admitted by them during 1933 was 15,294 males and 6,104 females, facts which prevent a satisfactory general picture of the monthly distribution of hospital admissions being obtained. The month of the greatest number of admissions was March in the case of the Cheeloo Hospital, Tsinan, May in the Menzies Hospital, Hwaiking, and August in the St. Paul's Hospital, Kweiteh. The composite curve has its peak for both male and female admissions

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in May. As the temperature curve has its peak in August, there is not the general correspondence and parallelism which has been noted in the graphs of South China and the Yangtze Region.

General: In reviewing the monthly admissions to hospitals during 1933 it is seen that these show some correlation with the mean monthly temperatures most marked in the large groups of the South China and Yangtze Regions. Thus, in the hot, humid, uncomfortable months of July and August, the greatest number of patients sought treatment. In all three regions January was distinguished by having the smallest numbers of patients, this being explained not only by the season being winter, but also by the Chinese New Year Festival happening in that month when, as usual, everyone who could possibly leave hospital or postpone seeking medical treatment did so.

Summary.

1. The sex ratio shows the striking figure of two males to one female and evidence is advanced that this is related to the constitution of urban populations and to the customs of the people. There is an interesting seasonal change in the ratio which is highest in summer and further striking difference in the ratio between South and North China.

2. The age distribution shows that the largest number of male and female patients belong to the

described, and comparisons made with an urban and a rural population.

3. The striking difference between the Chinese hospital population sample and the Mayo Clinic population is shown. Chinese hospital populations belong largely to the younger age groups, while the American populations are proportionately greater in the older groups.

4. The importance of the consideration of the factors of age and sex before comparison of the incidence of diseases in different populations can be made is stressed.

5. The monthly distribution of cases shows some correlation with the mean monthly temperatures, the greatest number of patients seeking treatment in July and August and the smallest number in January.

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CHAPTER IX.

GENERAL DISEASE INCIDENCE FOR 1933.

In this and the following chapter the aggregate returns are analysed on the basis of the short disease list. There is thus produced a broad outline of the major disease groups seen in hospital patients in China. Detailed accounts of specific groups follow in later chapters.

The hospitals which provided the records of this chapter are the seventeen hospitals which co-operated during 1933, while in the next chapter the 1934 results are discussed and comparisons of the two years made.

Firstly the question has to be asked "What were the main causes of disease and defect leading patients to enter hospital wards and out-patient departments during 1933?".

Examination of Table 6 and Figure 12 shows that the order of incidence of the chief disease groups according to the above classification is as follows:-

1. Diseases of the skin and cellular tissue, bones and organs of locomotion (Title 46).
2. Conditions of violence (excluding suicide) (Title 49).
3. Diseases of digestive system (excluding diarrhoea, appendicitis, hernia, anal fissure, and liver diseases) (Title 42).
4. Venereal diseases (Title 16).
5. Tuberculosis (Titles 13 and 14 combined).
6. Ill-defined and miscellaneous conditions (Title 50).

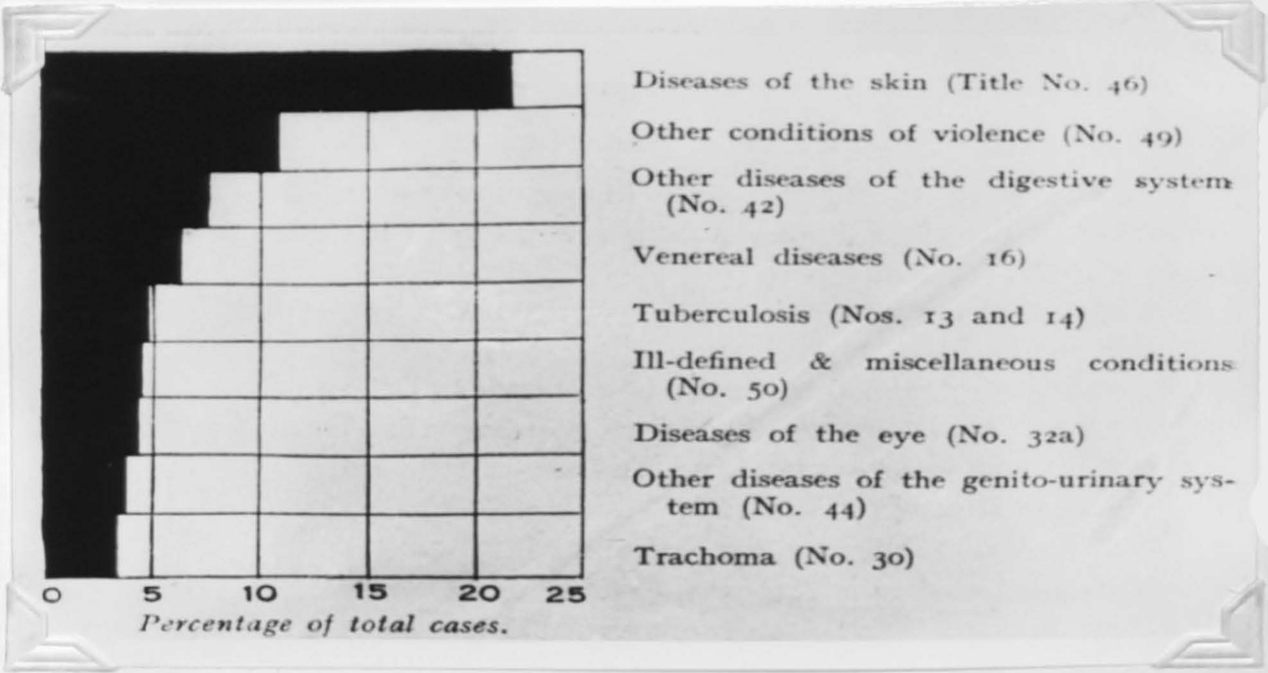

Figure 12. Percentage incidence of principal disease conditions.

TABLE 6 : RETURNS FROM THE SEVENTEEN HOSPITALS PROVIDING RECORDS OF ALL PATIENTS FOR 1933.

DISEASE.	Severance, Seoul.	Cheeloo, Tsinan.	Menzies, Hwaiking.	St. Paul's, Kweiteh.	University, Nanking.	Red Cross, Shanghai.	Lester, Shanghai.	General, Nanchang.	General, Wuhu.	Kwangchi, Hangchow.	Union, Hankow.	General, Changteh.	Hudson Taylor, Changsha.	Presbyterian, Hengchow.	Mission, Swatow.	General, Canton.	C.M.S. Yunnanfu.	TOTAL.
1. Typhoid and Paratyhpoid Fevers...	173	29	-	4	189	147	177	119	34	142	70	24	64	18	103	70	153	1,516
2. Typhus....	11	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	10	24
3. Relapsing Fever	-	56	-	-	4	1	51	6	3	1	14	-	-	-	2	1	47	186
4. Smallpox..	2	2	1	1	26	2	12	2	1	4	1	3	1	1	19	11	4	93
5. Measles..	11	11	-	1	17	-	-	4	3	4	-	-	2	5	13	6	114	191
6. Scarlet Fever..	15	48	6	9	11	11	13	-	-	15	1	1	1	-	-	1	10	142
7. Diphtheria	25	32	1	21	91	7	21	2	3	7	12	2	3	2	4	10	34	277
8. Influenza.	190	22	20	20	399	86	693	161	19	143	142	21	120	48	10	58	175	2,327
9. Cholera..	-	-	-	1	5	-	4	-	8	6	5	3	21	6	29	1	-	89
10. Dysentery	40	314	11	67	223	106	322	210	82	247	88	154	148	58	112	39	271	2,492
11. Plague..	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12. Cerebro-spinal Fever.	4	7	1	-	12	16	12	3	4	4	6	1	1	3	57	14	4	149
13. Tuberculosis of the Respiratory System.	510	467	64	219	556	400	695	369	208	694	474	169	504	96	103	321	220	6,069
14. Other Tuberculous Diseases.	491	505	87	230	270	166	505	329	140	330	204	107	264	158	131	111	166	4,194
15. Leprosy..	18	98	-	1	8	3	25	56	13	81	8	3	4	20	121	55	113	627
16. Venereal Diseases ...	1,029	798	388	353	1,119	308	2,311	485	312	1,447	563	686	858	758	457	279	792	12,943
17. Malaria..	50	147	29	71	522	67	185	167	101	990	138	79	77	179	93	440	414	3,749
18. Kala-azar	-	115	36	108	12	3	4	-	1	1	1	-	-	-	-	-	-	281
19. (a) Schistosomiasis..	-	-	-	-	6	12	13	7	8	3	35	9	1	-	-	-	-	94
(b) Other Helminthic Infections..	624	68	22	114	86	35	130	56	30	240	48	111	547	130	1,836	104	191	4,372
20. Other Infections and/or Parasitic diseases...	340	427	96	83	448	295	689	179	145	332	93	148	115	378	216	231	269	4,484
21. Cancer and other Tumours ..	323	321	141	204	218	77	497	119	157	377	166	102	121	120	372	258	115	3,688
22. Rheumatic Conditions.	160	98	35	67	200	60	361	51	61	215	100	98	307	75	125	132	455	2,600
23. Diabetes.	10	24	2	4	3	17	10	-	-	9	2	1	11	1	6	9	8	117
24. Beriberi.	53	-	1	-	37	42	292	51	9	34	14	2	67	3	15	115	104	839
25. Other General Diseases	39	54	4	8	15	16	25	11	9	11	12	15	16	2	12	39	106	394
26. Diseases of the Blood.	63	41	4	52	34	20	52	44	11	109	32	16	78	11	44	54	75	740
27. Acute and Chronic Opium Poisoning	13	40	3	33	86	52	588	66	38	126	88	33	38	6	8	4	438	1,660
28. Other Chronic Poisoning ...	9	4	-	1	3	10	29	5	1	8	36	3	5	9	-	-	9	132
29. Cerebral Haemorrhage, Apoplexy, etc. ..	55	42	11	29	30	22	85	12	10	46	33	13	43	5	5	27	37	505
30. Trachoma.	106	568	128	555	603	76	813	365	44	539	143	163	209	443	1,106	444	600	6,905
31. Diseases of the Ear, and Mastoid Sinus.	553	722	64	156	403	18	1,007	156	110	541	71	74	154	238	167	442	243	5,119
32. Other Diseases of																		
(a) The Eye ...	811	1,298	153	454	699	78	1,286	272	129	407	321	233	350	593	692	578	613	8,967
(b) Nervous System and Sense Organs ...	709	173	50	160	151	107	311	76	34	102	140	55	140	37	58	132	231	2,666
33. Diseases of the Circulatory System ...	523	444	53	149	561	395	1,167	301	211	561	299	208	350	185	303	212	632	6,554
34. Bronchitis	301	232	31	80	464	125	581	217	44	435	104	114	276	75	132	276	906	4,393
35. Pneumonia - all forms	93	60	9	3	176	110	124	58	11	47	68	13	52	12	69	59	78	1,042
36. Other Diseases of the Respiratory System	759	461	37	57	507	225	673	85	89	486	108	72	143	89	261	390	398	4,840
37. Diarrhoea and Enteritis ...	334	77	24	53	359	89	479	67	40	302	85	107	210	90	248	132	499	3,195
38. Appendicitis ..	80	33	11	10	85	37	111	10	15	23	29	6	4	2	2	55	9	522
39. Hernia, Intestinal Obstruction ..	62	81	8	34	53	38	150	23	22	64	30	24	42	16	24	29	28	728
40. Anal fistula, fissure	91	75	36	62	116	46	190	55	51	73	50	23	55	28	67	28	31	1,077
41. Diseases of the Liver and Biliary Passages...	127	37	4	32	40	27	75	22	5	19	30	17	8	18	17	39	77	594
42. Other Diseases of the Digestive System.	1,535	1,172	284	532	1,690	425	2,369	520	300	1,769	544	331	549	456	702	945	1,812	15,935
43. Nephritis..	81	53	6	49	86	30	111	59	11	96	30	29	40	29	58	64	189	1,021
44. Other Diseases of the Genito-urinary System..	1,319	428	68	281	929	342	824	245	165	675	308	205	268	179	355	423	728	7,742
45. Diseases and Conditions, Pregnancy, Childbirth, Puerperium	323	161	27	49	741	158	218	115	56	335	622	37	164	41	119	323	721	4,210
46. Diseases of the Skin, Cellular tissue, Bones and Organs of Locomotion ...	3,652	2,216	453	765	2,767	2,204	13,794	1,505	1,709	4,164	900	1,361	2,338	2,469	1,492	1,212	2,185	45,186
47. Congenital Malformation and Conditions Early Infancy	65	51	6	14	28	43	40	7	9	34	20	7	20	24	40	96	75	579
48. Suicide..	6	1	1	3	5	-	101	3	2	9	14	-	-	1	3	-	117	266
49. Other Conditions of Violence	1,069	458	125	474	1,200	1,164	11,308	893	486	1,722	638	388	309	449	730	480	533	22,426
50. Ill-defined and Miscellaneous Conditions	443	233	57	323	2,341	269	1,296	990	154	75[illegible]	420	104	398	102	326	630	260	9,104
TOTALS	17,300	12,804	2,598	5,996	18,634	7,987	44,832	8,558	5,088	18,767	7,360	5,375	9,486	7,668	10,914	9,379	15,299	208,045

7. Eye diseases (excluding trachoma) (Title 32a).
8. Genito-urinary diseases (excluding nephritis) (Title 44).
9. Trachoma (Title 30).

The absolute numbers and percentages of these conditions are given in Table 7.

Table 7 shows that in the total population from the seventeen hospitals sending all records, of 208,045 cases, one case in five belonged to the group classified under Title 46. Though this group includes conditions of bones, joints and muscles, these are relatively few in relation to conditions of the skin. Consequently, the conditions for which the largest group of patients sought treatment were skin affections such as boils, scabies, dermatitis, abscesses and other pyogenic infections.

The group second in importance is that of conditions of violence (Title 49), to which one in every ten patients belonged. Injuries of every type appeared - burns, gun-shot wounds, fractures, contusions, lacerations, dislocations and accidental poisonings.

The third group is another broad one (Title 42) including infections of the mouth, tonsils, oesephagus and conditions of the stomach and intestines other than tumours, hernias, diarrhoea and specific infections.

Occupying the fourth position is venereal disease (Title 16). The returns give 12,943 patients out of 208,045 seeking hospital advice on account of these diseases, i.e. over 6 per cent.

of/.....

TABLE 7 : INCIDENCE OF PRINCIPAL CONDITIONS IN ORDER OF IMPORTANCE.

Disease	46	49	42	16	13 & 14	50	32a	44	30
Title	Skin etc.	Violence	Digest-ive	Venereal	Tubercu-losis	Misc.	Eye	Genito-urinary	Trachoma
No. of Cases	45,186	22,426	15,935	12,943	10,263	9,104	8,967	7,742	6,905
Percentage of total cases	21.7	10.8	7.7	6.2	4.9	4.4	4.3	3.7	3.3

of the in-patients and out-patients seen in this group of hospitals had venereal disease of one form or another.

Tuberculosis (all forms) occupies the fifth position and includes 10,263 or 4.9 per cent. of the total cases, i.e. one patient out of every twenty seen by these hospitals during 1933 suffered from tuberculosis.

Having examined the conditions of chief numerical importance in the total cases of all hospitals, it is of interest to turn now to the individual returns for these hospitals and follow the same arrangement. This has been done in Table 8.

This table brings out several interesting features. The numerical order given by the aggregate returns for all hospitals is not repeated by any one individual hospital, but with only one exception, skin conditions (Title 46) provided the largest number of patients in each hospital. The exception is Swatow where "Other Helminthic Infections" (Title 19b) contained the largest number of cases and these were mainly hookworm infections. Skin conditions (Title 46) varied from 33.6 per cent. of the total cases in the Wuhu Hospital to 12.2 per cent. in the Union Hospital, Hankow.

Occupying the second place in numerical importance in each hospital three conditions appear with the same frequency. Digestive conditions (Title 42), venereal diseases (Title 16) and conditions of violence (Title 49), occupy second place in four hospitals each.

Other/.....

TABLE 8 : COMPARISON OF SIX PRINCIPAL CONDITIONS IN EACH HOSPITAL.

	Disease Titles in Order of Frequency.					
	1	2	3	4	5	6
1. Severance, Seoul	46	42	44	49	16	13 + 14
2. Cheeloo, Tsinan	46	32a	42	13 + 14	16	31
3. Menzies, Hwaiking	46	16	42	32a	13 + 14	21
4. St. Paul's, Kweiteh	46	30	42	49	32a	13 + 14
5. University, Nanking	46	50	42	49	16	44
6. Red Cross, Shanghai	46	49	13 + 14	42	33	44
7. Lester Chinese, Shanghai	46	49	42	16	50	32a
8. General, Nanchang	46	50	49	13 + 14	42	16
9. General, Wuhu	46	49	13 + 14	16	42	33
10. Kwangchi, Hangchow	46	42	49	16	13 + 14	17
11. Union, Hankow	46	13 + 14	49	45	16	42
12. General, Changteh	46	16	49	42	13 + 14	32a
13. Hudson Taylor, Changsha	46	16	13 + 14	42	19b	50
14. Presbyterian, Hengchow	46	16	32a	42	49	30
15. E.P. Mission, Swatow	19b	46	30	49	42	32a
16. General, Canton	46	42	50	32a	49	30
17. C.M.S., Yunnanfu	46	42	34	16	44	45
Total Hospitals	46	49	42	16	13 + 14	50

Other conditions appearing in the first six places may be mentioned. Eye conditions (Title 32a), trachoma (Title 30), and tuberculosis (Titles 13 and 14) each takes second place of numerical importance in one hospital. Bronchitis (Title 34) provided the third largest group of cases in Yunnan Hospital, while malaria formed the sixth largest group in the Kwangchi Hospital, Hanchow.

Infectious and parasitic diseases: These are the conditions classified under Titles 1-20 inclusive in the Survey short list. Arranged in order of numerical importance, the chief ones are given in Table 9 and Figure 13.

Venereal diseases (Title 16) contribute the greatest number of cases of the group of infectious conditions, giving 12,943 cases or 6.2 per cent. of the total cases. In the individual hospitals the incidence varied from 14.9 per cent. in the Menzies Memorial Hospital, Hwaiking, to 2.97 per cent. in the Canton Hospital. In only four out of the seventeen hospitals did it fail to appear within the first six disease groups.

Tuberculosis (Titles 13 and 14): This table is but another proof of the great importance of tuberculosis as a public health and medical problem in China, a fact which is only too often overlooked when interest tends to more exotic or acute diseases. In this Survey, in the infectious disease group, tuberculosis of all forms is second only to venereal disease in numerical importance, and in only six hospitals does it fail to appear in the first six

disease/.....

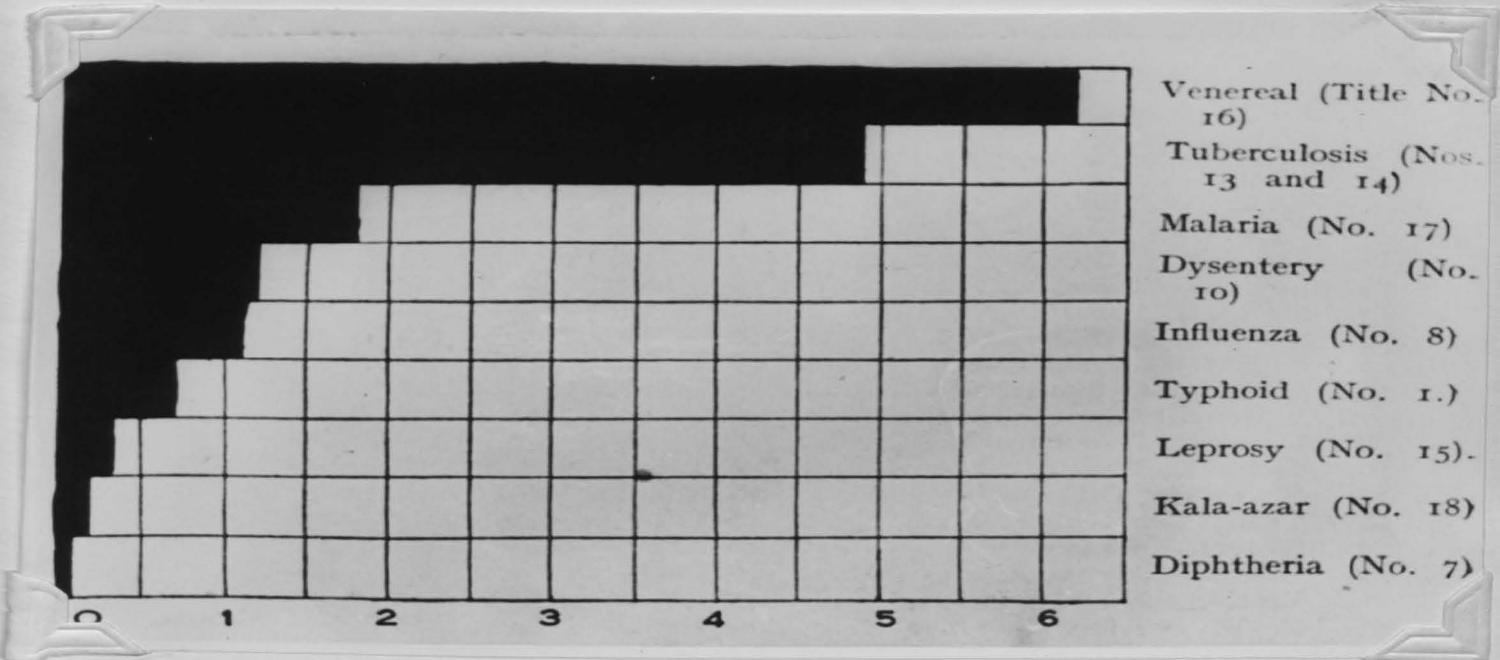

Figure 13. Percentage incidence of principal infectious and parasitic diseases.

TABLE 9 : INCIDENCE OF PRINCIPAL INFECTIOUS AND PARASITIC DISEASES.

Disease		Cases	Percentage of total cases
1. Venereal Diseases	Title 16	12,943	6.2
2. Tuberculosis	Titles 13 and 14	10,263	4.9
3. Malaria	Title 17	3,749	1.8
4. Dysentery	Title 10	2,492	1.2
5. Influenza	Title 8	2,327	1.1
6. Typhoid and paratyphoid	Title 1	1,516	.7
7. Leprosy	Title 15	627	.3
8. Kala-azar	Title 18	281	.2
9. Diphtheria	Title 7	277	.1

disease groups.

<u>Malaria</u> (Title 17) is the third in importance in the present group of hospitals with an incidence of 1.8 per cent. of the total cases. From Table 6 it can be seen that it was reported from each of the hospitals, indicative of its presence throughout China.

<u>Leprosy</u> (Title 15): The widespread nature of leprosy is shown by this infection being reported by sixteen out of the seventeen hospitals co-operating in part or in whole during 1933. The largest numbers were returned by Tsinan, Swatow and Yunnanfu. Each of the hospitals in these three places is provided with a special leprosy department.

<u>Kala-azar</u> (Title 18): Nine of the seventeen hospitals listed in Table 6 reported cases of this disease, covering the area from Peiping in the north to Hangchow in the south, and from Changsha in the west to Shanghai in the east.

<u>Diphtheria</u> (Title 7) was reported from all hospitals and had a higher hospital incidence than either scarlet fever or measles.

<u>Typhus</u> (Title 2) was reported from Seoul, Shanghai and Yunnanfu.

<u>Relapsing fever</u> (Title 3): The fact that cases were reported from Tsinan, Nanking, Shanghai, Nanchang, Wuhu, Hangchow, Hankow, Swatow, Canton and Yunnan, is evidence of the widespread distribution of this disease in China during 1933.

<u>Measles</u> (Title 5): The following centres did not report this disease:- Hwaiking, Shanghai, Hankow and Changteh.

Scarlet/.....

Scarlet fever (Title 6): Only four of the hospitals did not report this disease (Table 6):- Nanchang and Wuhu in the Yangtze Valley, Hengchow in the south of Hunan Province and Swatow on the South China coast.

Cholera (Title 9): Cases were reported from Kweiteh, Nanking, Shanghai, Wuhu, Hangchow, Hankow, Changteh, Changsha, Hengchow, Swatow and Canton among the seventeen hospitals listed in Table 6. Though this indicates a notification of cholera during 1933 from many widely distributed areas, it should be pointed out that these cases were listed from cards which did not give particulars as to the grounds on which diagnoses were made, therefore the records do not indicate whether the diagnosis rested on a bacteriological basis.

Cerebro-spinal fever (Title 12): In all of the seventeen hospitals was the disease seen during the year.

Schistosomiasis (Title 19a) was reported from the hospitals along the Yangtze, from Shanghai at its mouth to Changteh in Hunan.

Remarks on Some Other Conditions.

Cancer and other tumours (Title 21): Tumours numbered 3,688 or 1.8 per cent. of total cases. Western surgery has made one of its greatest appeals to the Chinese in its treatment of tumours and this is revealed in the large numbers reported under this heading.

Diabetes (Title 23): It is of interest to note that only one of the seventeen hospitals did

not/.....

not report cases.

Beriberi (Title 24): Two hospitals, Tsinan and Kweiteh, did not report cases and the remaining fifteen hospitals showed wide variations in numbers of cases from 1.2 per cent. of total cases in Canton to 0.4 per cent. in Hwaiking.

Acute and chronic opium poisoning (Title 27): This title includes all cases of opium poisoning other than those qualified as being suicidal. Nevertheless as the majority of opium cases reported were not qualified in any way, it can be surmised that this title includes numbers of suicides. In fact, general experience would indicate that the majority are probably of this nature. The occurrence of cases in all hospitals is indicative of the importance of the conditions. Yunnan Hospital with 2.8 per cent. of total cases gives the highest incidence.

Trachoma (Title 30): In the seventeen hospitals trachoma comes sixth in numerical importance with 6,905 cases or 3.3 per cent. of total cases. This emphasises the prevalence and importance of the disease in China. All hospitals reported cases but its highest incidence was at Swatow with 10.1 per cent. and at Kweiteh with 9.3 per cent. of total cases.

Diseases of the eye (Title 32a): These diseases formed the large proportion of 4.3 per cent. of the total conditions and when it is remembered that trachoma provides 3.3 per cent. of total cases, the enormous amount of eye conditions calling for treatment in the hospitals is appreciated.

Diseases of the ear and mastoid sinus (Title 31): Ear conditions too are of great importance as they formed 2.5 per cent. of total cases seen.

Diseases of the circulatory system (Title 33): These should be considered bearing in mind that the classification is an extremely broad one including not only conditions of the heart, arteries and veins, but also diseases of the lymphatic system. It is the lumphatic conditions which bulk largest.

Respiratory conditions (Titles 34, 35, 36) if grouped together total 10,275 cases or 4.9 per cent. of the total cases. Cases of bronchitis number 4,393 cases and pneumonia, 1,042 cases.

Appendicitis (Title 38): Each of the seventeen hospitals recorded cards of the condition giving 522 cases or .3 per cent. of the total cases. On many occasions controversy has raged as to the incidence of appendicitis in the Chinese, which, from this study would seem not to be so rare as was formerly believed.

Suicide (Title 48): The relatively few cases, 266 or .1 per cent. of the total cases, by no means represent all suicidal conditions. It has been stated above that many of the opium conditions with unqualified diagnoses are probably suicidal, as are other unqualified acute poisonings listed under Title 49.

Summary.

The hospitals returned one card for each new patient seen during 1933. The main conditions

of/.....

of the aggregate total of the seventeen hospitals were:-

(a) Diseases of the skin.
(b) Conditions of violence.
(c) Diseases of the digestive system.
(d) Venereal diseases.
(e) Tuberculosis.
(f) A group of miscellaneous and ill-defined conditions.
(g) Diseases of the eye.
(h) Diseases of the genito-urinary system.
(i) Trachoma.

CHAPTER X.

GENERAL DISEASE INCIDENCE FOR 1934.

In Table 10 the twenty-five hospitals co-operating during 1934 are listed in three regional groups, giving the number of patients recorded by each. Some modifications of the short disease list were introduced for 1934. These changes are given in Table 11.

In the 1933 list Title No. 33 did not differentiate circulatory conditions, but in 1934 the distinction of these into diseases of the heart and blood vessels and into diseases of the lymphatic system has been made. Similarly the 1933 Title 46 has been split into two groups for the 1934 list, viz: Title 46 giving diseases of the skin and cellular tissue, and Title 47 giving diseases of the bones and organs of locomotion. A last important change to note is that fractures have been separated from the general group of conditions of violence occurring in Title 49 and placed in a single class, that of Title 48.

These few alterations do not affect to any material degree the general comparison between the 1933 and 1934 disease lists. The great majority of the items in the two lists are directly comparable and in most of the other cases can be made so by combining titles of the 1934 list to give the same grouping as was used in the 1933 list.

<u>The chief disease groups compared for 1933 and 1934</u>: For both sexes combined the chief disease groups of the 1933 and the 1934 returns are given

for/.....

TABLE 10 : HOSPITALS BY REGIONS CO-OPERATING IN SURVEY DURING 1934.

Region	Hospital	City	Number of Patients
South China	Canton	Canton	7,263
	C.M.S.	Yunnanfu	17,439
	E.P.Mission	Swatow	10,074
	Hope	Kulangsu, Amoy	2,083
	Union	Foochow	5,905
			42,764
Yangtze Region	Presbyterian	Hengchow	6,364
	Hudson Taylor	Changsha	6,131
	Methodist, General	Hankow	5,352
	Union	Hankow	9,411
	Methodist, General	Teian	2,775
	Bethesda	Siangyang	3,614
	University	Nanking	19,830
	Christian	Suchowfu	14,460
	General	Nanchang	9,779
	Methodist	Wusueh	2,325
	Christian	Luchowfu	6,141
	General	Wuhu	6,019
	Kwangchi	Hangchow	19,430
	Lester Chinese	Shanghai	59,039
			170,670
North China	Menzies Memorial	Hwaiking	2,273
	St. Paul's	Kweiteh	6,333
	Taylor Memorial	Paotingfu	6,214
	Mackenzie Memorial	Tientsin	26,489
	Cheeloo University	Tsinan	6,687
	General	Changte	7,254
			55,250
	Total Hospitals		268,684

TABLE 11 : MODIFICATIONS OF THE 1933 DISEASE LIST MADE FOR USE IN THE 1934 LIST.

Title No.	1933	1934
11	Plague	Anterior Poliomyelitis
33	Diseases of the Circulatory System	(a) Diseases of the Heart and Blood Vessels. (b) Diseases of the Lymphatic System
40	Anal Fistula and Fissure	Ulcer of the stomach and Duodenum.
46	Diseases of Skin, Cellular Tissue, Bones and Organs of Locomotion	Diseases of Skin and Cellular Tissue.
47	Congenital Malformations and Conditions of Early Infancy	Diseases of the Bones and Organs of Locomotion.
48	Suicide	Fractures.

TABLE 12 : COMPARISON OF THE CHIEF DISEASE GROUPS OF 1933 AND 1934.

1933				1934		
	Disease Title	No. of Cases	Percentage of Total Cases	Disease Title	No. of Cases	Percentage of Total Cases
1.	Diseases of skin, cellular tissue bones and organs of locomotion (Title 46)	45,186	21.7	Diseases of skin and cellular tissue (Title 46)	54,012	20.10
2.	Conditions of violence (Title 49)	22,426	10.8	Conditions of violence (Title 49)	25,263	9.40
3.	Diseases of Digestive system (Title 42)	15,935	7.7	Diseases of Digestive system (Title 42)	22,939	8.54
4.	Venereal Diseases (Title 16)	12,943	6.2	Venereal Diseases (Title 16)	15,896	5.92
5.	Tuberculosis (Titles 13 and 14)	10,263	4.9	Diseases of the Eye (Title 32(a))	14,003	5.21
6.	Miscellaneous conditions (Title 50)	9,104	4.4	Miscellaneous conditions (Title 50)	13,237	4.93
7.	Diseases of the Eye (Title 32(a))	8,967	4.3	Tuberculosis (Titles 13 and 14)	12,837	4.77
8.	Diseases of the Genito-urinary system (Title 44)	7,742	3.7	Trachoma (Title 30)	10,456	3.89
9.	Trachoma (Title 30)	6,905	3.3	Diseases of the Genito-urinary system (Title 44)	9,005	3.35

for ease of comparison in Table 12.

The nine groups of greatest numerical importance are given for each year and it is of no little interest that though the order is dissimilar in the two years, the groups are the same. Further, in the case of the order of the first four groups the two years are identical, namely, diseases of the skin, conditions of violence, diseases of the digestive system and, lastly, venereal diseases. Not only is the order of numerical importance the same but the percentage of the total cases formed by each disease group shows very little difference in the two years. Diseases of the skin, conditions of violence and venereal diseases have a slightly lower incidence in 1934 than in 1933, but this is off-set by a higher incidence in the former year of diseases of the digestive system, diseases of the eye, miscellaneous conditions and tuberculosis.

The repetition by the 1934 hospital returns of the results of the 1933 analysis is most interesting and important. The close parallelism of the percentage incidence of the chief causes of morbidity in hospital populations in two successive years, especially as the hospitals considered are the largest and most representative of institutions in China, lends strong support to the conclusion that the relative numerical relationship of these disease groups is a reflection of the situation in the disease population as a whole treated by scientific medicine in the country. Deduction from the consideration of the survey

populations/.....

populations that morbidity in the general population is of the same proportional ratio is, of course, not justified, but strong support is lent to the view that the chief causes of gross disease and ill-health are dirt conditions, injuries, digestive factors, venereal diseases and tuberculosis in that order in non-epidemic phases. Such findings suggest the direction public health and general medical development should follow in China.

Regional differences in the major disease groups: The nine chief disease groups in numerical order for the three regions are given in percentage form in Table 13.

Diseases of the skin occupy first place in each region, but there is a distinct difference between the proportion of skin conditions seen in South China as compared with the other two regions. In South China skin conditions form 12.56 per cent. of all cases, while the figures for the Yangtze Region and North China are 22.29 per cent. and 19.17 per cent. respectively.

Conditions of violence, i.e. lacerations, sprains, burns, contusions, but not fractures, are twice as common in the Yangtze Region as in the other regions, i. e. 11.65 per cent. compared with 5.07 per cent. in South China and 5.82 per cent. in North China.

Eye conditions as a whole, i.e. including trachoma, also reveal some regional differences with incidences of 11.59 per cent. for South China and 11.57 per cent. for North China, but 7.67 per cent. for the Yangtze Region.

TABLE 13 : DISEASE GROUPS GIVEN IN PERCENTAGE NUMERICAL ORDER BY REGIONS FOR ALL PERSONS.

	South China	Yangtze Region	North China
1.	Diseases of the Skin 12.56	Diseases of the Skin 22.29	Diseases of the Skin 19.17
2.	Digestive Diseases 9.09	Conditions of Violence 11.65	Digestive Diseases 11.42
3.	Diseases of the Eye 6.05	Digestive Diseases 7.47	Diseases of the Eye 7.39
4.	Trachoma 5.54	Venereal Diseases 6.43	Tuberculosis 6.89
5.	Conditions of Violence 5.07	Miscellaneous Conditions 5.60	Conditions of Violence 5.82
6.	Urino-Genital 4.89	Tuberculosis 4.34	Venereal Diseases 5.74
7.	Miscellaneous Conditions 4.55	Diseases of the Eye 4.29	Trachoma 4.18
8.	Conditions of Pregnancy 4.15	Trachoma 3.38	Diseases of the Ear 3.63
9.	Venereal Diseases 4.12	Urino-Genital 3.08	Miscellaneous Conditions 3.12

Tuberculosis is perhaps the most interesting disease in providing regional contrasts. In South China it forms 3.74 per cent. of all patients and thus does not figure in the group of the nine most important numerical groups. Tuberculosis is the sixth disease in numerical importance in the Yangtze Region with a percentage of 4.34, while in North China it is more prominent still with a percentage of 6.89, being thus the fourth most frequent disease condition. In distinguishing between respiratory and non-respiratory tuberculosis the interesting feature of a progressive rise in the proportion of non-respiratory to respiratory tuberculosis is seen in proceeding from south to north, the ratio of percentages being:-

	Percentage of all cases.	
	Respiratory.	Non-Respiratory.
South China	2.61	1.13
Yangtze Region	2.96	1.38
North China	3.03	3.86

North China not only has a greater incidence of tuberculosis as a whole in its hospital population but the non-respiratory outnumber the respiratory forms of the disease. This regional difference, both in total incidence of tuberculosis and in the ratio of the respiratory and non-respiratory forms, is similar to that shown for the 1933 records which will be discussed in some detail in the chapter on tuberculosis.

Venereal diseases with percentages of 4.12 for South China, 6.43 for the Yangtze Region and 5.74 for North China indicate once again the

TABLE 14 : THE CASE INCIDENCE FOR EACH HOSPITAL FOR 1934.

DISEASE.	Union Hospital, Foochow.	Hope Hospital, Kulangsu.	Canton Hospital, Canton.	Mission Hospital, Swatow.	C.M.S. Hospital, Yunnanfu.	Christian Hospital, Luchowfu.	General Hospital, Wuhu.	Kwanchi Hospital, Hangchow.	Presbyterian Hospital, Hengchow.	Methodist General Hospital, Hankow.	Union Hospital, Hankow.	Bethesda Hospital, Siangyang.	Methodist General Hospital, Teian.	Methodist Hospital, Wusueh.	General Hospital, Nanchang.	University Hospital, Nanking.	Lester Chinese Hospital, Shanghai.	Christian Hospital, Suchowfu.	Hudson Taylor Hospital, Changsha.	General Hospital, Changte.	Menzies Memorial Hospital, Hwaiking.	St. Paul's Hospital, Kweiteh.	Taylor Memorial Hospital, Paotingfu.	Mackenzie Memorial Hospital, Tientsin.	Cheeloo University Hospital, Tsinan.	GRAND TOTAL.	Percentage.
1. Typhoid and Paratyphoid Fevers	144	57	75	70	232	27	50	118	30	9	61	3	6	5	135	257	187	19	23	25	-	21	35	39	42	1,670	0.62
2. Typhus	-	-	-	-	9	-	-	1	-	-	-	-	-	-	-	-	-	-	7	4	1	-	5	8	-	35	0.01
3. Relapsing Fever	7	2	1	-	84	1	-	3	-	10	39	-	1	-	26	3	92	4	-	1	-	-	6	4	1	285	0.11
4. Smallpox	-	-	1	2	7	1	-	1	3	4	2	1	-	-	19	6	16	5	4	5	3	2	-	5	-	87	0.03
5. Measles	19	13	6	7	155	-	3	38	4	5	16	2	-	-	14	93	70	11	30	11	1	5	2	6	6	517	0.19
6. Scarlet Fever	1	-	1	-	25	-	3	4	-	-	-	1	-	-	1	18	16	8	-	15	1	10	1	8	8	121	0.05
7. Diphtheria	12	2	10	14	36	9	7	16	2	2	11	-	-	-	4	78	51	87	8	4	11	7	3	20	26	420	0.16
8. Influenza	29	28	62	7	403	21	82	146	20	11	174	6	15	6	128	487	510	49	101	55	4	14	2	204	26	2,590	0.96
9. Cholera	-	2	-	12	-	1	-	1	1	1	4	1	-	2	-	1	1	20	6	1	-	-	-	1	-	55	0.02
10. Dysentery	47	27	35	86	279	90	117	379	135	58	156	64	61	16	186	259	509	196	65	142	16	96	93	301	335	3,748	1.39
11. Anterior Poliomyelitis	3	-	4	-	2	2	1	4	1	1	2	-	-	-	2	7	8	-	-	9	2	4	1	2	1	56	0.02
12. Cerebro-spinal Fever	1	3	15	12	-	2	12	-	48	18	13	-	-	1	5	3	14	14	-	-	-	-	-	2	2	165	0.06
13. Tuberculosis of the Respiratory System	406	111	230	85	285	97	206	662	199	163	633	71	77	62	557	606	934	497	304	95	43	284	272	432	547	7,858	2.92
14. Other Tuberculous Diseases	109	23	71	84	195	69	140	280	119	105	200	63	27	32	107	190	580	360	91	213	77	137	166	1,250	291	4,979	1.85
15. Leprosy	25	3	29	107	94	1	10	54	3	24	17	-	-	1	47	5	39	14	4	-	-	2	4	7	80	570	0.21
16. Venereal Diseases	305	108	228	334	784	228	327	1,307	607	428	762	285	196	132	654	947	3,428	1,113	554	328	326	382	232	1,153	748	15,896	5.92
17. Malaria	177	70	296	45	358	272	171	714	99	125	178	51	134	146	328	325	230	100	22	67	19	63	95	88	48	4,222	1.57
18. Kala-azar	-	-	-	-	-	-	7	1	1	-	1	-	-	-	3	15	13	1,643	-	111	45	152	34	26	125	2,177	0.81
19. (a) Schistosomiasis	-	-	-	-	-	-	34	16	-	24	36	-	10	24	10	6	45	-	-	-	-	-	-	-	-	205	0.08
(b) Other Helminthic Infections	107	8	96	1,234	244	86	37	238	75	111	49	84	33	55	49	84	113	398	229	119	27	131	94	78	102	3,881	1.44
20. Other Infectious and/or Parasitic Diseases	76	35	119	146	337	193	208	351	287	65	152	77	49	23	197	287	1,223	167	66	117	82	111	158	599	106	5,231	1.95
21. Cancer and Other Tumours	209	47	189	312	129	84	152	297	81	123	220	56	38	35	141	240	596	319	89	251	99	237	177	467	256	4,844	1.80
22. Rheumatic Conditions	24	13	83	72	394	96	56	193	40	54	124	34	30	25	58	147	426	181	156	145	20	63	87	385	37	2,943	1.10
23. Diabetes	1	2	12	4	6	2	2	8	3	5	7	1	1	-	1	5	10	9	-	14	-	10	5	7	35	150	0.06
24. Beriberi	94	16	103	30	54	4	3	44	3	15	21	-	4	-	39	44	155	3	14	1	-	-	2	2	7	658	0.24
25. Other General Diseases	9	5	28	4	110	11	14	23	10	12	6	5	-	-	16	15	62	42	20	7	7	11	9	34	29	489	0.18
26. Diseases of the Blood	24	9	27	36	73	23	19	72	8	21	54	1	13	15	21	44	109	141	32	41	6	45	21	47	31	933	0.35
27. Acute and Chronic Opium Poisoning	4	17	9	13	660	25	38	163	1	61	165	78	15	39	50	109	950	51	12	26	24	45	11	111	25	2,702	1.01
28. Other Chronic Poisoning	1	-	2	1	11	-	2	3	1	54	55	1	14	18	2	6	38	4	-	2	1	-	-	-	7	223	0.08
29. Cerebral Haemorrhage, Apoplexy, etc.	12	2	18	9	44	14	9	63	11	16	36	5	11	6	14	43	114	57	22	27	18	43	9	84	27	714	0.27
30. Trachoma	311	82	370	1,157	450	380	69	512	520	249	172	242	70	51	401	845	1,510	576	176	646	71	388	404	800	4	10,456	3.89
31. Diseases of the Ear, and Mastoid Sinus	189	49	353	196	323	263	125	514	154	56	80	104	79	28	163	426	1,493	256	136	304	91	137	218	771	487	6,995	2.60
32. Other Diseases of																											
(a) The Eye	652	91	525	624	697	591	174	438	349	924	262	163	147	107	463	643	2,204	582	279	747	215	451	439	1,883	353	14,003	5.21
(b) Nervous System and Sense Organs	63	22	74	48	326	76	66	183	32	38	159	29	26	8	124	194	431	138	94	84	23	145	87	321	99	2,890	1.08
33. (a) Diseases of the Heart and Blood Vessels	83	47	129	188	485	68	127	347	93	141	252	48	39	64	154	337	673	252	127	142	50	138	219	501	186	4,890	1.82
(b) Diseases of the Lymphatic System	38	16	36	127	167	49	84	243	91	121	147	43	21	30	192	257	911	182	128	54	18	52	46	569	50	3,672	1.37
34. Bronchitis	104	51	118	34	1,039	105	89	359	53	106	148	137	57	99	293	310	744	78	186	126	10	118	163	758	216	5,591	2.08
35. Pneumonia - all forms	62	33	56	60	155	77	24	85	45	30	71	4	6	18	107	168	109	74	32	15	2	9	36	36	55	1,369	0.51

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CHINESE.	Union Hospital, Foochow.	Hope Hospital, Kulangsu.	Canton Hospital, Canton.	Mission Hospital, Swatow.	C.M.S. Hospital, Yunnanfu.	Christian Hospital, Luchowfu.	General Hospital, Wuhu.	Kwangchi Hospital, Hangchow.	Presbyterian Hospital, Hoochow.	Methodist General Hospital, Hankow.	Union Hospital, Hankow.	Bethesda Hospital, Siangyang.	Methodist General Hospital, Teian.	Methodist Hospital, Wusueh.	General Hospital, Nanchang.	University Hospital, Nanking.	Lester Chinese Hospital, Shanghai.	Christian Hospital, Suchowfu.	Hudson Taylor Hospital, Changsha.	General Hospital, Changte.	Menzies Memorial Hospital, Hwaiking.	St. Paul's Hospital, Kweiteh.	Taylor Memorial Hospital, Paotingfu.	Mackenzie Memorial Hospital, Tientsin.	Cheeloo University Hospital, Tsinan.	GRAND TOTAL.	Percentage.
36. Other Diseases of the Respiratory System	113	73	307	397	504	154	150	580	82	27	132	60	36	43	209	607	898	340	187	118	20	71	250	572	443	6,373	2.37
37. Diarrhoea and Enteritis	104	34	90	199	514	50	110	454	49	25	120	11	23	60	176	603	600	167	87	73	9	92	146	305	75	4,176	1.55
38. Appendicitis	21	9	49	6	16	14	33	72	4	10	28	-	2	9	25	108	121	16	1	35	6	6	19	67	39	716	0.27
39. Hernia, Intestinal Obstruction	31	12	32	25	43	24	16	45	9	23	42	9	13	10	33	64	145	59	20	29	6	51	68	74	78	961	0.36
40. Ulcer of the Stomach and Duodenum	89	30	34	11	134	14	54	93	17	24	88	5	2	8	101	206	248	28	10	70	35	12	33	90	185	1,621	0.60
41. Diseases of the Liver and Biliary Passages	26	17	55	22	58	19	10	37	12	32	45	9	5	13	34	43	89	31	6	15	2	26	25	67	39	737	0.27
42. Other Diseases of the Digestive System	220	130	709	917	1,909	652	394	1,752	399	367	721	256	221	149	506	1,960	3,590	1,297	486	1,032	291	606	691	3,152	532	22,939	8.54
43. Nephritis	33	7	69	37	277	27	21	126	9	54	46	19	15	5	40	69	72	109	29	30	10	43	31	91	56	1,325	0.49
44. Other Diseases of the Genito-urinary System	248	120	396	375	954	128	151	720	142	176	376	109	65	90	333	960	1,228	563	217	222	58	343	143	595	293	9,005	3.35
45. Diseases and Conditions, Pregnancy, Childbirth, Puerperium.	348	107	288	105	924	40	80	521	48	23	1,086	45	22	62	185	939	406	311	137	104	20	81	-	70	13	5,965	2.22
46. Diseases of the Skin and Cellular Tissue	609	262	812	1,450	2,247	1,273	1,621	4,362	1,925	825	975	1,034	906	447	1,537	2,391	16,848	2,497	1,399	803	288	841	917	7,438	305	54,012	20.10
47. Diseases of the Bones and Organs of Locomotion	47	28	38	87	148	48	62	102	38	72	81	30	23	13	100	86	402	55	19	86	36	57	79	308	88	2,133	0.79
48. Fractures	46	24	20	13	29	31	54	170	20	38	84	28	5	17	60	125	936	38	7	14	18	31	22	97	4	1,931	0.72
49. Other Conditions of Violence	284	148	372	766	599	362	542	1,788	393	375	627	193	155	168	534	1,093	12,664	803	186	209	99	374	379	2,094	56	25,263	9.40
50. Ill-defined and Miscellaneous Conditions	338	88	581	504	431	247	253	727	88	91	475	146	102	183	1,195	3,066	2,178	496	323	460	62	386	275	460	82	13,237	4.93
TOTAL	5,905	2,083	7,263	10,074	17,439	6,141	6,019	19,430	6,364	5,352	9,411	3,614	2,775	2,325	9,779	19,830	59,039	14,460	6,131	7,254	2,273	6,333	6,214	26,489	6,687	268,684	100.00

importance of these causes in attracting patients to hospitals for treatment throughout the country. In South China and the Yangtze Region the group is the largest of the infectious or contagious disease groups being treated, while in North China it is second only to tuberculosis as a specific infectious cause of disease.

Consideration of Some Infectious Diseases. (Tables 14 and 15.)

Typhoid fever: Reference to Tables 14 and 15 shows that the disease was reported throughout China during 1934. In fact only one hospital, the Menzies Memorial at Hwaiking, did not return cases. The largest number, 257 cases, both absolutely and relatively, occurred in the University Hospital, Nanking, and the next, 232 cases, in the Yunnan Hospital. The Survey provides evidence that typhoid is to be found not only in such cities as Shanghai and Nanking where Western civilisation is introducing certain elements of Western customs and diet, but also in the remoter country towns in which the population still follows ancient ways.

Typhus: Four hospitals in North China, two hospitals in the Yangtze Valley and one hospital in South China recorded cases of typhus. These widespread foci of infection are not unexpected in peoples living under the conditions of the Chinese are are a reminder that the disease is an ever-present menace liable to rapid spread.

Relapsing fever: Even more widespread were the sources of relapsing fever, cases being reported from most hospitals but in greatest numbers from Shanghai and Yunnan.

Smallpox/.....

TABLE 15 : PERCENTAGE INCIDENCE OF DISEASE CONDITIONS BY REGIONS.

Diseases	South China			Yangtze Region			North China			Total Hospitals 1934			Total Hospitals 1933.
	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	P.
1. Typhoid and Paratyphoid Fevers	1.52	1.14	1.35	.55	.54	.55	.33	.16	.29	.62	.62	.62	.73
2. Typhus	.01	.03	.02	.01	.01	.01	.04	.02	.03	.01	.01	.01	.01
3. Relapsing Fever	.33	.09	.22	.14	.04	.11	.03		.02	.13	.04	.11	.09
4. Smallpox.	.01	.04	.02	.03	.06	.04	.03	.03	.03	.02	.05	.03	.04
5. Measles.	.54	.38	.47	.12	.27	.17	.06	.06	.06	.16	.26	.19	.09
6. Scarlet Fever.	.07	.07	.06	.03	.04	.03	.06	.13	.08	.04	.06	.05	.07
7. Diphtheria	.13	.22	.17	.12	.25	.16	.11	.20	.13	.12	.24	.16	.13
8. Influenza	1.22	1.26	1.24	1.12	.82	1.03	.61	.35	.55	1.01	.85	.96	1.12
9. Cholera.	..02	.04	.03	.03	.02	.02		.01	.01	.02	.02	.02	.04
10. Dysentery	1.40	.76	1.11	1.40	1.20	1.33	1.94	1.22	1.78	1.53	1.10	1.39	1.20
11. Anterior Poliomyelitis	.03	.01	.02	.01	.02	.02	.04	.04	.03	.02	.02	.02	Not listed.
12. Cerebro-spinal Fever.	.09	.05	.06	.06	.11	.08	.01		.01	.05	.08	.06	.07
13. Tuberculosis of the Respiratory System	3.03	2.13	2.61	3.19	2.49	2.96	3.22	2.39	3.03	3.17	2.39	2.92	2.92
14. Other Tuberculous Diseases.	1.22	1.03	1.13	1.26	1.68	1.38	3.48	5.19	3.86	1.77	2.05	1.85	2.02
15. Leprosy.	.85	.32	.60	.17	.04	.13	.20	.06	.17	.26	.11	.21	.30
16. Venereal Diseases	5.03	3.03	4.12	7.35	4.14	6.43	6.14	4.33	5.74	6.83	3.91	5.92	6.22
17. Malaria.	2.54	1.82	2.22	1.96	1.09	1.69	.79	.35	.69	1.76	1.15	1.57	1.80
18. Kala-azar				1.17	.56	1.00	.98	.59	.89	.98	.44	.81	.14
19. (a) Schistosomiasis.				.17	.03	.13				.10	.02	.08	.05
(b) Other Helminthic Infections.	5.35	2.30	3.95	.85	1.23	.96	1.01	.97	.99	1.45	1.44	1.44	2.10
20. Other Infectious and/or Parasitic Diseases.	1.85	1.46	1.68	1.91	2.07	1.96	2.24	1.71	2.12	1.98	1.88	1.95	2.16
21. Cancer and other Tumours	1.63	2.59	2.08	1.11	2.21	1.45	2.13	4.66	2.69	1.41	2.66	1.80	1.77
22. Rheumatic Conditions.	1.22	1.54	1.37	.85	1.16	.95	1.21	1.75	1.33	.98	1.35	1.10	1.25
23. Diabetes.	.07	.04	.06	.03	.03	.03	.13	.11	.13	.06	.04	.06	.06
24. Beriberi.	.83	.53	.69	.26	.07	.20	.03	.01	.02	.28	.17	.24	.40
25. Other General Diseases	.26	.49	.36	.08	.27	.14	.08	.49	.17	.10	.36	.18	.21
26. Diseases of the Blood	.31	.59	.39	.26	.49	.34	.28	.59	.35	.27	.51	.35	.36
27. Acute and Chronic Opium Poisoning	2.21	.98	1.65	.86	1.41	1.03	.44	.45	.44	.93	1.17	1.01	.80
28. Other Chronic Poisoning	.03	.04	.03	.15	.04	.12	.01	.01	.02	.10	.04	.08	.06
29. Cerebral Haemorrhage, Apoplexy, etc.	.26	.13	.19	.26	.21	.25	.38	.38	.38	.29	.21	.27	.24
30. Trachoma.	4.45	6.82	5.54	3.20	3.80	3.38	3.82	5.46	4.18	3.50	4.75	3.89	3.32
31. Diseases of the Ear and Mastoid Sinus.	2.68	2.49	2.57	2.25	2.38	2.27	3.70	3.40	3.63	2.63	2.55	2.60	2.46
32. Other Diseases of													
(a) The Eye	5.86	6.28	6.05	4.43	3.98	4.29	6.84	9.33	7.39	5.17	5.31	5.21	4.31
(b) Nervous System and Sense Organs	1.36	1.11	1.25	.89	1.04	.94	1.28	1.71	1.37	1.04	1.15	1.08	1.28
33. (a) Diseases of the Heart and Blood Vessels.	2.17	2.25	2.19	1.60	1.59	1.59	2.33	1.93	2.24	1.83	1.80	1.82	) 3.15)
(b) Diseases of the Lymphatic System.	1.03	.74	.90	1.59	1.17	1.46	1.39	1.54	1.43	1.48	1.13	1.37	)
34. Bronchitis	3.03	3.26	3.16	1.58	1.89	1.67	2.38	2.99	2.51	1.95	2.37	2.03	2.11
35. Pneumonia - all forms	.89	.81	.85	.44	.63	.49	.30	.20	.28	.46	.61	.51	.50
36. Other Diseases of the Respiratory System	3.35	3.15	3.26	2.06	2.05	2.05	2.81	2.16	2.67	2.40	2.32	2.37	2.33
37. Diarrhoea and Enteritis	2.37	1.99	2.22	1.42	1.63	1.48	1.35	.97	1.26	1.52	1.62	1.55	1.54
38. Appendicitis	.29	.17	.23	.29	.19	.26	.30	.35	.32	.29	.21	.27	.25
39. Hernia, Intestinal Obstruction	.54	.11	.34	.39	.10	.30	.69	.10	.55	.47	.10	.36	.35
40. Ulcer of the Stomach and Duodenum	.80	.57	.69	.56	.46	.53	.82	.61	.77	.65	.51	.60	Not listed
41. Diseases of the Liver and Biliary Passages.	.53	.31	.42	.25	.15	.23	.35	.20	.32	.31	.20	.27	.29
42. Other Diseases of the Digestive System.	8.59	9.66	9.09	7.22	7.88	7.47	11.30	11.76	11.42	8.39	8.87	8.54	8.18
43. Nephritis.	1.03	.94	.99	.38	.36	.38	.48	.46	.47	.48	.51	.49	.49
44. Other Diseases of the Genito-urinary System.	2.64	7.55	4.89	1.79	6.04	3.08	2.24	5.56	2.99	2.00	6.31	3.35	3.72
45. Diseases and Conditions, Pregnancy, Childbirth, Puerperium		9.02	4.15		7.49	2.29		2.32	.53		7.09	2.22	2.02
46. Diseases of the Skin and Cellular Tissue	13.55	11.44	12.56	23.57	19.61	22.29	20.58	14.24	19.17	21.56	16.92	20.10	21.72
47. Diseases of the Bones and Organs of Locomotion	.99	.61	.82	.71	.56	.66	1.21	1.08	1.18	.86	.65	.79	
48. Fractures.	.47	.11	.31	1.10	.59	.94	.39	.14	.34	.86	.41	.72	
49. Other Conditions of Violence	6.98	2.82	5.07	13.5[illegible]	2.33	11.65	6.63	3.00	5.82	11.12	5.63	9.40	10.91
50 Ill-defined and Miscellaneous Conditions	4.54	4.77	4.55	[illegible]	6.48	5.60	2.80	4.23	3.12	4.55	5.74	4.93	4.65
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total Number of Patients.	23,122	19,642	42,764	118,463	52,107	170,670	42,822	12,428	55,250	184,507	84,177	268,684	208,045

Smallpox: That the primitive living conditions existing in China breed dangerous infectious diseases is shown not only by the occurrence of typhus and relapsing fever, but also by the appearance of smallpox in hospitals throughout the country. It is the virulent smallpox, too, which ravages the population of China.

Measles: This is no mean cause of hospital admissions in China. With a total of 517 cases it was more numerous than either scarlet fever or diphtheria in the present hospital population. Only three hospitals, those at Luchowfu, Teian and Wusueh, did not see measles. The largest numbers of cases were at Nanking, Shanghai and Yunnan.

Scarlet fever: The Survey generally confirmed the statement that this disease is relatively mild and infrequent in the south, with the exception of Yunnan situated at an altitude, but prevalent in North China.

Diphtheria: Three hospitals in the Yangtze Valley at Siangyang, Teian and Wusueh, failed to report the disease. The returns of the other hospitals did not reveal any regional difference in the incidence of diphtheria.

Cholera: The interest of 55 cases noted in the present Survey lies in the fact that 1934 was a non-epidemic year in China. These cases were reported on a basis of clinical findings only, yet on that account should not be dismissed as valueless. The majority of the reporting physicians are men of profound experience of many cholera epidemics in

China/.....

China and who would not lightly diagnose cholera in non-epidemic times except in cases with classical symptoms. With the exception of Changte in the north, and Swatow and Kulangsu on the south coast, the cases come from the Yangtze River basin which has been so often in the past the scene of appalling outbreaks. These sporadic small groups of cases in 1934 aroused the suspicion that the Yangtze Valley, at any rate, may be scattered with endemic cholera, the sources of the spread in epidemic years. Early opinion was that cholera was generally introduced to the Yangtze area from outside, but latterly the above suspicion of endemic foci has also been raised by Chun (1). It was on the Survey evidence that the suggestion was placed before the Central Cholera Bureau of Shanghai of examining bacteriologically such cases in the future. This suggestion has been adopted and it is hoped that evidence will soon be gathered regarding this important epidemiological factor (2).

Dysentery: This group of diseases is a major cause of morbidity as 3,748 cases were admitted into the Survey hospitals during 1934. Indeed every hospital reported large numbers of cases. There is a progressive increase from south to north in the proportion of cases - South China 1.11 per cent., Yangtze Region 1.33 per cent. and North China 1.78 per cent., but it is doubtful whether this has any regional significance as the figures for the incidence of diarrhoea and enteritis (Title 37) are in the reverse order.

Anterior/.....

Anterior poliomyelitis: W. S. New (3) has called attention to the lack of information regarding the incidence of this disease in China. Accordingly a separate title was included in the disease list for 1934 with the interesting and important outcome that eighteen hospitals from all parts reported cases. The widespread occurrence of this nervous disease is thus proved and should lend interest to a fuller investigation as to its exact incidence in various parts of the country.

Cerebro-spinal meningitis: The tables in the present report indicate that the disease occurred in most hospitals with its highest incidence of 48 cases in the hospital at Hengchow.

Leprosy: The 107 cases reported by the Swatow Hospital is an indication of the vigorous anti-leprosy activity there which is being watched with great interest by other administrators. The establishment of clinics in the surrounding districts has been a great success. The Survey reveals again the heaviest incidence of the disease in the provinces of Kwangtung and Fukien.

Malaria: In 1934 malaria again appeared as an important item in all hospital records. It was by no means limited to the tropical and subtropical regions as all the co-operating hospitals in North China reported numerous cases. Hangchow and Yunnan suffered the heaviest incidence.

Kala-azar: The distribution of this disease was similar to that reported for 1933. The provinces north of the Yangtze produced the highest number

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of cases, but an interesting feature is the discovery of cases in hospitals fairly remote from the endemic area such as at Wuhu, Hengchow and Hankow. The Suchowfu Hospital provided the greatest number of cases, 1,643, which makes it one of the most important institutions in the world treating this form of Leishmaniasis.

Schistosomiasis: The present records reflect the findings of 1933, viz: that the Yangtze Valley is an infected area.

Consideration of Some Other Disease Groups.

Tumours: In 1933 tumours formed 1.77 per cent. of the patients seen in hospitals returning complete records. In 1934 tumours numbered 4,844 or 1.80 per cent. of all patients. There are no regional peculiarities.

Diabetes: As an index of its occurrence in China it may be noted that only two hospitals failed to record cases - the hospitals in Hwaiking and Wusueh.

Beriberi: The present group of hospitals illustrates the general distribution of beriberi in China in that the northern hospitals situated amongst populations consuming wheat and millet and not rice showed an incidence of only .02 per cent. while the hospitals in Southern China reported a percentage of .69. The highest incidence occurred in the Canton Hospital with 103 cases and in the Lester Hospital, Shanghai, with 155 cases. The high figure in the Lester Hospital is to some extent

explained/.....

explained by the special investigation into beriberi being carried on there by Platt and Gin who are consequently discovering cases which, in ordinary circumstances, would probably be overlooked (4).

Bronchitis, pneumonia and influenza: On account of their epidemiological relationship these three conditions are considered together. During 1934 a general influenzal outbreak occurred in China and this is reflected in the increased incidence in the hospital admissions for the disease as compared with 1933. The incidence was highest in South China with 1.24 per cent. of all patients, and lowest in North China with .55 per cent. Similarly bronchitis and pneumonia showed a higher hospital incidence for 1934 and the same geographical differences as the following percentage table shows:-

	South China	Yangtze Region	North China
Influenza	1.24	1.03	.55
Bronchitis	3.16	1.67	2.51
Pneumonia	.85	.49	.28

Ulcer of the stomach and duodenum: In 1933 this item was not separately noted in the disease list. Consequently the return of 1,621 cases diagnosed as ulcer of the stomach or duodenum is of some value. All hospitals noted the condition. This information is most suggestive that the Chinese suffer to some degree from peptic ulceration and indicates the need for a close investigation to determine its real extent and distribution, especially as such factors as diet and cooking differ so markedly from European customs.

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The Sex Factor in Disease Incidence.

In a previous chapter the peculiarities of the sex differences in hospital populations were examined. It is of some value to determine whether the analysis of the present records using the short disease list indicates any difference in the sex incidence of disease groups. This will be done by reference to Table 15. The total hospital patients shows the first interesting difference in tuberculosis. The ratio of respiratory to non-respiratory tuberculosis is 3.17: 1.77 in the males and 2.39: 2.05 in the females. Non-respiratory tuberculosis is thus relatively more frequent in the female in China than in the male.

The expected state of affairs is seen in the case of venereal diseases as the male cases form a greater proportion of total male hospital population than female cases do of total females, viz: 6.83 per cent. males and 3.91 per cent. females admitted for venereal diseases.

Another feature in which the 1934 records repeat the 1933 results is in the relatively greater proportion of tumours seen in female patients than in male patients, viz: 1.41 per cent. males and 2.66 per cent. females admitted suffering from tumours.

In diseases of the ear and diseases of the eye, including trachoma, the same percentage incidence is noted in each sex. Both in bronchitis and pneumonia the female percentages are higher than the male.

A greater prominence of urino-genital conditions is expected in females; female cases formed 6.31

per/.....

TABLE 16 : PERCENTAGE INCIDENCE OF THE PRINCIPAL DISEASE CONDITIONS IN EACH SEX.

	Males		Females	
1.	Skin Conditions	21.56	Skin Conditions	16.92
2.	Conditions of Violence	11.12	Diseases of the Digestive System	8.87
3.	Diseases of the Digestive System	8.39	Diseases and Conditions of Pregnancy	7.09
4.	Venereal Diseases	6.83	Diseases of the Genito-Urinary System	6.31
5.	Diseases of the Eye	5.17	Miscellaneous Conditions	5.74
6.	Tuberculosis	4.94	Conditions of Violence	5.63
7.	Miscellaneous	4.55	Diseases of the Eye	5.31
8.	Trachoma	3.50	Trachoma	4.75

per cent. of total female patients and male cases 2.00 per cent. of total males. Similar expectations are the higher proportion of males than females suffering from skin conditions and conditions of violence.

If Table 15 is examined it will be observed that the above statements are true for each of the three regions taken separately.

In Table 16 and Figure 14, the eight principal disease conditions in each sex are displayed. This reveals interesting differences for though the group of skin conditions is the principal disease in both sexes, yet the relative order of the other conditions varies.

Conditions of violence are the second greatest numerical group in the males, but only the sixth in the females. Venereal diseases and tuberculosis do not figure at all in the eight most important disease groups numerically in females, while venereal diseases are fourth and tuberculosis sixth in importance in the males. On the other hand diseases of the genito-urinary system are prominent in the female list with a percentage incidence of 6.31 and yet do not appear in the first eight male groups. Diseases of the eye and trachoma are roughly similar in importance in both.

Comparative Studies.

The lack of uniform classification is the bugbear of the statistician when he attempts comparative studies. This is well illustrated by the medical statistics of China. Hospital annual

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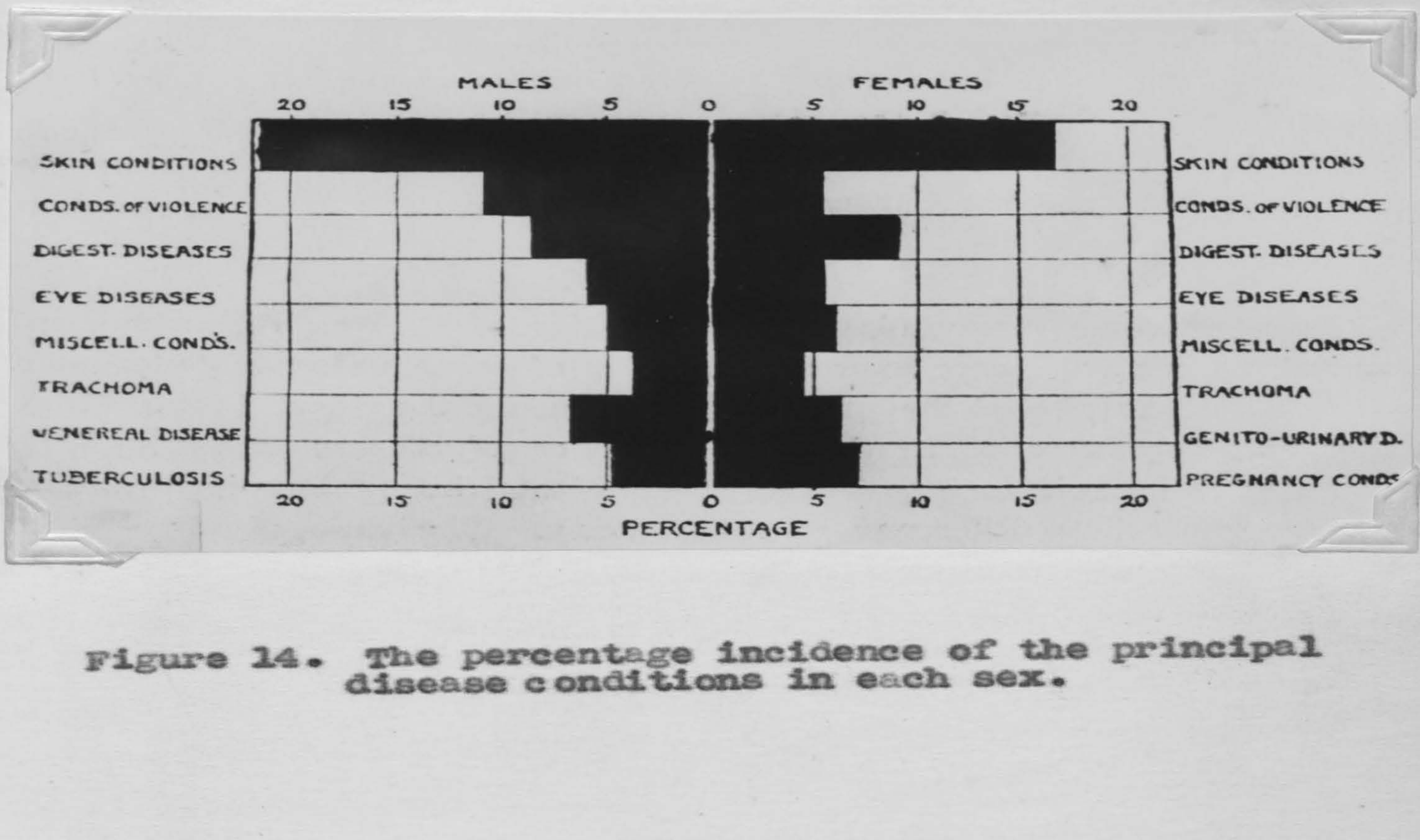

Figure 14. The percentage incidence of the principal disease conditions in each sex.

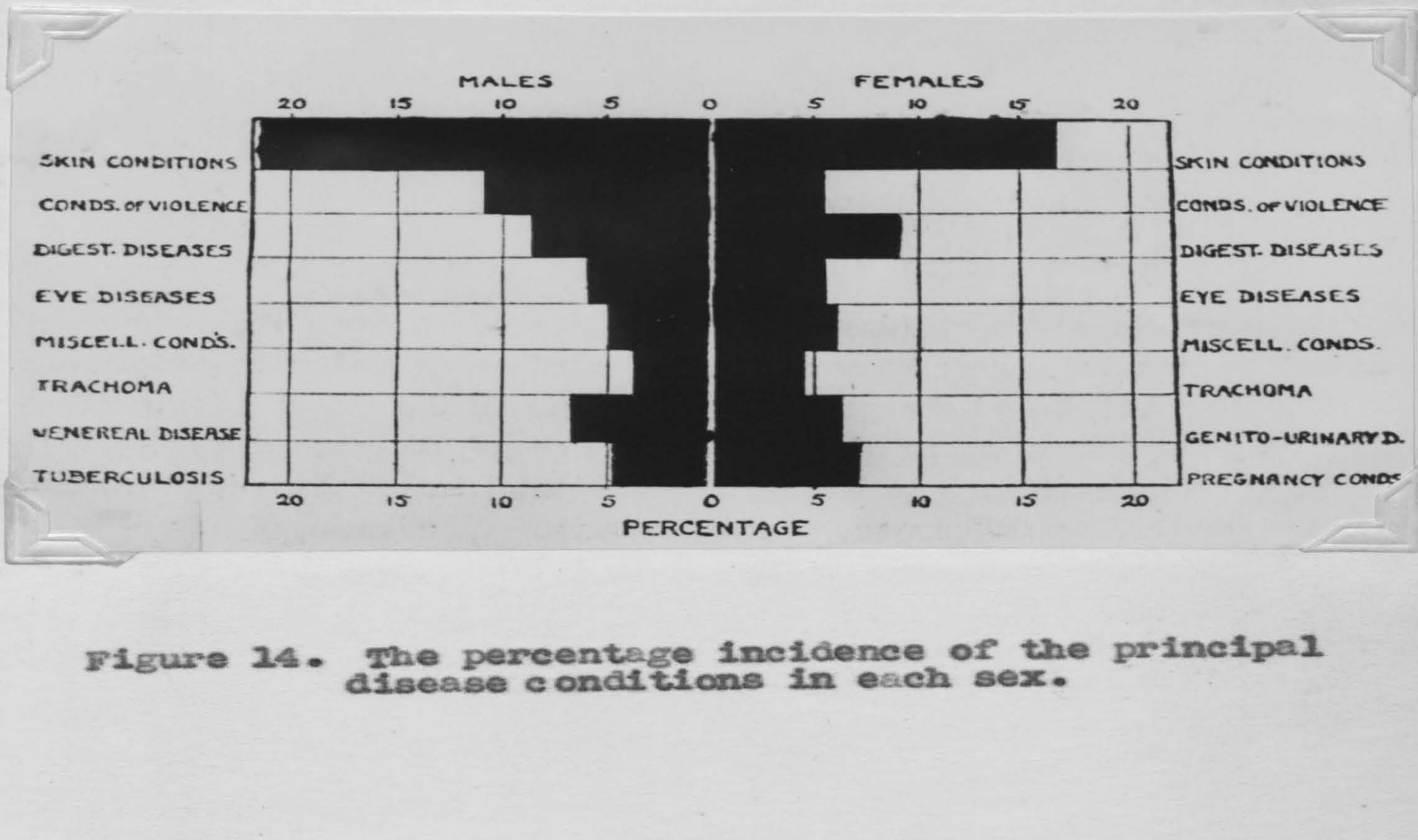

Figure 14. The percentage incidence of the principal disease conditions in each sex.

reports, municipal statistical tables and a few special field studies, it has been seen, represent the little that has been attempted in the collection of vital and medical statistics. These, however, are largely rendered useless for comparative purposes by the variety in the disease classifications used, a state of affairs, however, in the hospitals which is being slowly altered through the efforts of such workers as Maxwell and Chapman. Amongst the most valuable studies in local disease incidence in China, as has been seen, are those of the Ting Hsien Experimental Mass Education Movement and the First Special Health Station in Peiping. In Table 17 the chief 1934 Survey results are compared with the findings in the clinics of the Ting Hsien Experimental Area (5). It illustrates the difficulties, in fact the impossibility, of direct comparison in the absence of a standard disease classification. Nevertheless some rough conclusions are admissible. In the hospitals in China skin diseases are the most numerous, forming 20.10 per cent. of all patients, but in Ting Hsien they provide only 8.3 per cent. of the cases. Digestive diseases in the hospital populations form 8.54 per cent. but only 4.6 per cent. of the Ting Hsien patients. Eye conditions, including trachoma, form only 5.21 per cent. of the hospital patients but the enormous percentage of 30.4 of the Ting Hsien group. Venereal diseases are not noted in the Experimental Area list at all.

Much useful work in urging uniform morbidity and mortality reporting has been accomplished by

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TABLE 17 : CHIEF RESULTS OF THE SURVEY AND TING HSIEN AREA COMPARED.

Chinese Medical Association Survey			Ting Hsien Clinics	
	Disease	Percentage	Disease	Percentage
1.	Diseases of the Skin	20.10	Diseases of the Eye	30.4
2.	Conditions of Violence	9.40	Surgical Conditions	29.9
3.	Diseases of Digestive System	8.54	General Medical Conditions	11.8
4.	Venereal Diseases	5.92	Skin Diseases	8.3
5.	Diseases of the Eye	5.21	Diseases of Ear, Nose and Throat	7.0
6.	Miscellaneous Conditions	4.93	Gastro-intestinal Conditions	4.6
7.	Tuberculosis	4.77	Parasitic Conditions including Malaria and Kala-azar	2.5

TABLE 18 : MORBIDITY FIGURES OF THE SURVEY COMPARED WITH MORTALITY FIGURES OF TWO CHINESE EXPERIMENTAL AREAS.

C.M.A. Survey		Special Health Area Peiping		Ting Hsien Area	
Diseases	Percentage	Diseases	Death Rate per 100,000	Diseases	Death Rate per 100,000
1. Skin Diseases	20.10	Respiratory T.B.	303	Respiratory T.B.	397.5
2. Conditions of Violence	9.40	Respiratory Diseases	260	Senility and Apoplexy	283.1
3. Digestive Diseases	8.54	Digestive Diseases	244	Respiratory Diseases	225.2
4. Venereal Diseases	5.92	Cardio-renal Diseases	166	Convulsions	150
5. Eye Diseases	5.21	Convulsions	125	Diarrhoea and Enteritis	137.0
6. Miscellaneous Conditions	4.93	Senility and Apoplexy	120	Cardio-renal Diseases under 2 years	123.8

the workers of the Peiping Union Medical College and their classification of causes of death is being extended. Two lists drawn up on this classification are given in Table 18.

The first is from the First Special Health Station as drawn up by Grant and Yuan (6), while the second is from the Ting Hsien area as given by Che'n (5). Interest lies in determining even in this rough comparison how far the diseases which kill are the diseases which predominate in sick populations. In the morbidity group, i.e. the hospital populations of the Survey, it has been demonstrated that skin conditions, conditions of violence, digestive diseases, venereal diseases and eye diseases are most important numerically. In the mortality groups the table portrays quite a different picture. Tuberculosis and respiratory disease generally, in both the special areas, were the great killing diseases, followed by cardio-renal disease and convulsions. This comparison is but another demonstration that the chief agencies in killing people are not the predominant causes of sickness.

Summary.

1. Comparison of the principal disease groups of the two years has demonstrated a close similarity, not only in order of importance, but in percentage proportion of each disease group.

2. The chief causes of disease for 1934 were:-

   (a) Diseases of the skin.
   (b) Conditions of violence, i.e. injuries.
   (c) Diseases of the digestive system.
   (d) Venereal diseases.
   (e) Eye diseases.
   (f) Miscellaneous conditions.

(g)/.....

(g) Tuberculosis.

(h) Trachoma.

3. Differences of disease incidence on a regional basis of South China, Yangtze Region and North China are noted and discussed.

4. Comparisons of the present Survey results are given with other morbidity and mortality studies in China, illustrating once again the difficulties of statistical study in the absence of uniformity of methods.

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2. Report. Central Cholera Bureau. Nat. Quarantine Service Reports. Shanghai. Series 5: 197, 1934.

3. New, W. S. "Acute Anterior Poliomyelitis in China." Chinese Med. Jour. 48: 42, 1934.

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5. Che'n, C. C. "Public Health in Rural Reconstruction at Ting Hsien." Annual Report. 26, 1933.

6. Grant, J. B. and Yuan, I. C. "A Note on the Forces of Mortality and their Classification in Peiping." Chinese Med. Jour. 46: 1187, 1932.

CHAPTER XI.

TUBERCULOSIS.

Time and again has the importance of tuberculosis in China been emphasised. The work of Korns (1) on the material of the Peiping Union Medical College Hospital, the pathological investigations carried out by Scott (2) and Minnett (3) and the death-rates quoted by Bume (4) of the First Health Area of Peiping (384 per 100,000 inhabitants) and Hongkong (319 per 100,000 inhabitants) may be instanced as presenting a convincing and alarming picture of the serious nature of the disease in China. These and many other writers dwell on those economic and social habits of the people which undoubtedly contribute to the high incidence: extreme poverty, malnutrition and undernourishment, the appalling congestion in the urban areas, the huddling together in unhygienic dwellings, the sharing of common feeding bowls and chop-sticks, and the universal habit of expectoration. Burnet (5) has stated of tuberculosis that "to stamp it out it would be necessary to revolutionise society". The revolution of the social system and customs in China would have to be devastating indeed to produce the desired effect, but according to Burnet again: "The first requirement of any administration which is determined to stamp out tuberculosis, is that it shall see where it stands, that is, ascertain the situation as regards tuberculosis in the country concerned; the number of deaths, the number of

cases/.....

cases, their age and the circumstances of each case. Social hygiene must be based upon as accurate and complete an epidemiological census as possible." The stock-taking of tuberculosis should not have the revelation of the extent of this disease as its sole object but should be interpreted as an index of the general well-being of the population, a point of view expressed by Crocket (6) when he calls tuberculosis "an, or <u>the</u> index disease - the index disease pointing to the conditions of life and of work prevailing in any district or country". The examination of the records of tuberculosis of the Survey therefore is of more than usual importance.

The study of the general incidence of disease in these hospitals revealed the importance of tuberculosis in that section of the population which comes under the observation of scientific medicine in China. Tuberculosis figured as the fifth most frequent cause of disease among the total number of in-patients and out-patients seen in the seventeen hospitals co-operating in 1933, there being 10,263 cases or 4.9 per cent. of tuberculosis in 208,045 total patients. Venereal disease was the only infectious condition to be reported in greater numbers.

In the present chapter it is intended to examine the tuberculosis records of sixteen of the seventeen hospitals which forwarded complete returns of both new in-patients and out-patients during 1933. The Severance Union Hospital of Seoul in Korea has been excluded as falling outside

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the geographical divisions adopted for purposes of the present study. The proportions that tuberculosis formed of all conditions seen in each hospital are demonstrated in Table 19.

Many interesting features are demonstrated in this table. Of 190,745 patients recorded from wards and out-patient departments, 9,149 or 4.80 per cent. were diagnosed as tuberculous, and of these 5,992 cases were tuberculosis of the respiratory system and 3,157 were of the non-respiratory type. In terms of percentages 65.5 per cent. of all tuberculous patients were of the respiratory, and 34.5 per cent. of the non-respiratory type of the disease. The proportions of respiratory forms of tuberculosis in other reported studies are given for comparison in the following table:-

	Percentage of Total Cases of Tuberculosis		
Series	Respiratory Tuberculosis.	Non-Respiratory. Tuberculosis.	Total Cases of Tuberculosis.
Present	65.5	34.5	9,149
Canton (7)	58.6	41.4	2,019
Peiping (8)	49.8	50.2	3,063
Indian (9)	62.8	37.2	1,019
Dutch East Indies (10)	85.5	14.5	5,492

The present series shows a rough approximation to the results given for the Chinese group investigated by Oldt (7) in Canton, but a difference of over 15 per cent. from that given by Korns (8)

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TABLE 19 : THE NUMBER OF CASES OF RESPIRATORY AND NON-RESPIRATORY TUBERCULOSIS AND THE PERCENTAGE INCIDENCE OF TUBERCULOSIS FROM EACH HOSPITAL.

	Hospital	Respiratory Tuberculosis	Non-Respiratory Tuberculosis	Cases of Tuberculosis Patients	Per Cent. of All Patients	Total In-patients and Out-patients
North China	1. Cheeloo, Tsinan	382	490	872	6.81	12,804
	2. Menzies, Hwaiking	64	87	151	5.81	2,598
	3. St.Paul's, Kweiteh	262	187	449	7.49	5,996
		708	764	1,472	6.88	21,398
Yangtze Region	1. University, Nanking	616	208	824	4.42	18,634
	2. Red Cross, Shanghai	406	159	565	7.07	7,987
	3. Lester, Shanghai	710	489	1,199	2.64	44,832
	4. General, Nanchang	584	115	699	8.17	8,558
	5. General, Wuhu	216	132	348	6.84	5,088
	6. Kwangchi, Hangchow	700	320	1,020	5.44	18,767
	7. Union, Hankow	483	195	678	9.21	7,360
	8. General, Changteh	203	74	277	5.15	5,375
	9. Hudson Taylor, Changsha	605	163	768	8.10	9,486
		4,523	1,855	6,378	5.06	126,087
South China	1. Presbyterian, Hengchow	109	142	251	3.27	7,668
	2. Mission, Swatow	104	130	234	2.14	10,914
	3. General, Canton	331	100	431	4.60	9,379
	4. C.M.S., Yunnanfu	217	166	383	2.50	15,299
		761	538	1,299	3,00	43,260
	Total Hospitals	5,992	3,157	9,149	4.80	190,745

for a Peiping group. The Indian cases studied in the polyclinics of Calcutta by Ukil (9) are closely parallel. On the other hand, the hospital patients of Java show the high proportion of 85 per cent. of tuberculous patients suffering from the respiratory form. In view of the similarity of the Indian figures and the present series, it is enlightening to note that Ukil ascribes the features of the disease in Indians to epidemiological conditions resembling those existing in China. The similarity may be emphasised by the following quotation from his report (9):-

> "To understand the epidemiology of tuberculosis in India, we ought to remember that 90 per cent. of India's population still reside in the villages, and that urbanisation, modern industrialisation and the introduction of rapid transport facilities, have been powerful factors in the diffusion of population during the last fifty to sixty years. Certain habits, such as spitting inside habitations, eating and drinking from common vessels, and sleeping together in the same room, are extremely common among all classes of society, and favour massive infection. The malnutrition factor appears noteworthy, for the diet of the people in most parts of India has become unbalanced and inadequate within the same period. Another fact of great importance is that infection with

the bovine type of tubercle bacillus
is practically non-existent in India."

With the exception that China, though now rapidly changing, has lagged behind India in industrialisation and transportation, the above passage applies in every particular to this country.

Reverting to Table 19 again, the incidence of tuberculosis is seen to range from 9.21 per cent. of all patients in the Hankow Union Hospital to 2.14 per cent. of all patients in the Swatow Hospital. Adopting the geographical divisions given in the table, it is of great interest that the incidence of tuberculosis is highest in the North China group (6.88 per cent.) and lowest in the South China group (3.00 per cent.). Though the differences are numerically significant, ignorance of the factors governing hospital population constitution in the different areas at this stage minimises the importance to be attached to the figures. However, they are most suggestive of differences that probably exist in tuberculosis incidence from the north to the south.

The Incidence of the Various Forms of Tuberculosis.

The consideration only of in-patient statistics of hospitals in China would give an inaccurate impression of the proportions of the various forms of tuberculosis in that section of the disease population which appeals for treatment to scientific medicine. This is explained by the selection in

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one form or another which all hospitals make in admitting patients to wards, and which is in many instances directed to the exclusion of tuberculous - especially phthisical - patients on account of other more urgent calls on bed occupancy. The truer picture is seen in the combined records of in-patients and out-patients and for this reason the present series has a great value as it is the first occasion that such data collected on a uniform basis have been made available from all areas of China. These figures are given in Table 20 and compared with records given by Korns (1) on the out-patients and in-patients of the Peiping Union Medical College Hospital, with records given by Chun (11) of the out-patients of the Harbin Hospital, and with those of the clinics of Calcutta hospitals given by Ukil (9).

The three Chinese groups show little agreement, the variation being particularly noticeable in the Harbin figures where respiratory tuberculosis forms only 18 per cent. of all tuberculosis, and skin tuberculosis the extraordinarily high figure of 11.1 per cent. No other series has given such a low percentage of pulmonary tuberculosis, and though it may represent the situation in the far north, it is certainly not a correct indication of the importance of pulmonary tuberculosis in China as a whole. The lower case incidence of respiratory tuberculosis in the Peiping series as compared with the present hospital group is balanced by a proportionately higher incidence of lymphatic and skeletal tuberculosis.

Chun/.....

TABLE 20 : INCIDENCE OF THE CHIEF FORMS OF TUBERCULOSIS IN CHINESE HOSPITAL POPULATIONS AND IN AN INDIAN HOSPITAL SERIES.

Type	China Present Series	China Peiping (Korns)	China Harbin (Chun)	India (Ukil)
1. Respiratory	65.49	49.79	18.1	62.8
2. Intestinal	3.51	4.83	-	4.3
3. Vertebral	4.33	-	-	-
4. Bones and Joints	12.78	16.03	30.8	13.9
5. Skin	.97	1.21	11.1	-
6. Lymphatic	9.61	20.86	35.9	17.0
7. Other Forms	3.31	7.28	4.1	2.0
	100.00	100.00	100.0	100.0
Total Cases	9,149	3,063	2,962	1,019

Chun (11) has indicated that on proceeding northwards through China the proportion of non-respiratory tuberculosis rises, which would explain the relatively higher incidence of these conditions in the Peiping Hospital than in the average drawn from hospitals scattered throughout China.

The Indian hospital clinic series given by Ukil (9) shows a similar proportion of respiratory tuberculosis to the present group, but lymphatic tuberculosis is more frequent. Skin tuberculosis is extremely rare in India and the present Chinese group confirms other studies in indicating a similar situation in China.

The material provided by the present Survey demonstrates again that lymphatic and skeletal tuberculosis is not inconsiderable in China and that intestinal and peritoneal forms are by no means rare which raises the question of bovine sources (Table 21, Figure 15). Studies of the type of the bacillus in tuberculous lesions of the Chinese have not yet proceeded sufficiently far for conclusions to be drawn and similarly few or no investigations into the incidence of tuberculosis in either the domestic or wild animals of China have been reported. In 1917 Stanley (12) recorded the incidence of tuberculosis in the slaughterhouses of Shanghai. There were no native cattle among the 17 rejected on account of this disease from a total of 165,000 slaughtered, and more recent findings of the Veterinary Division of the Shanghai Municipal Council give similar results.

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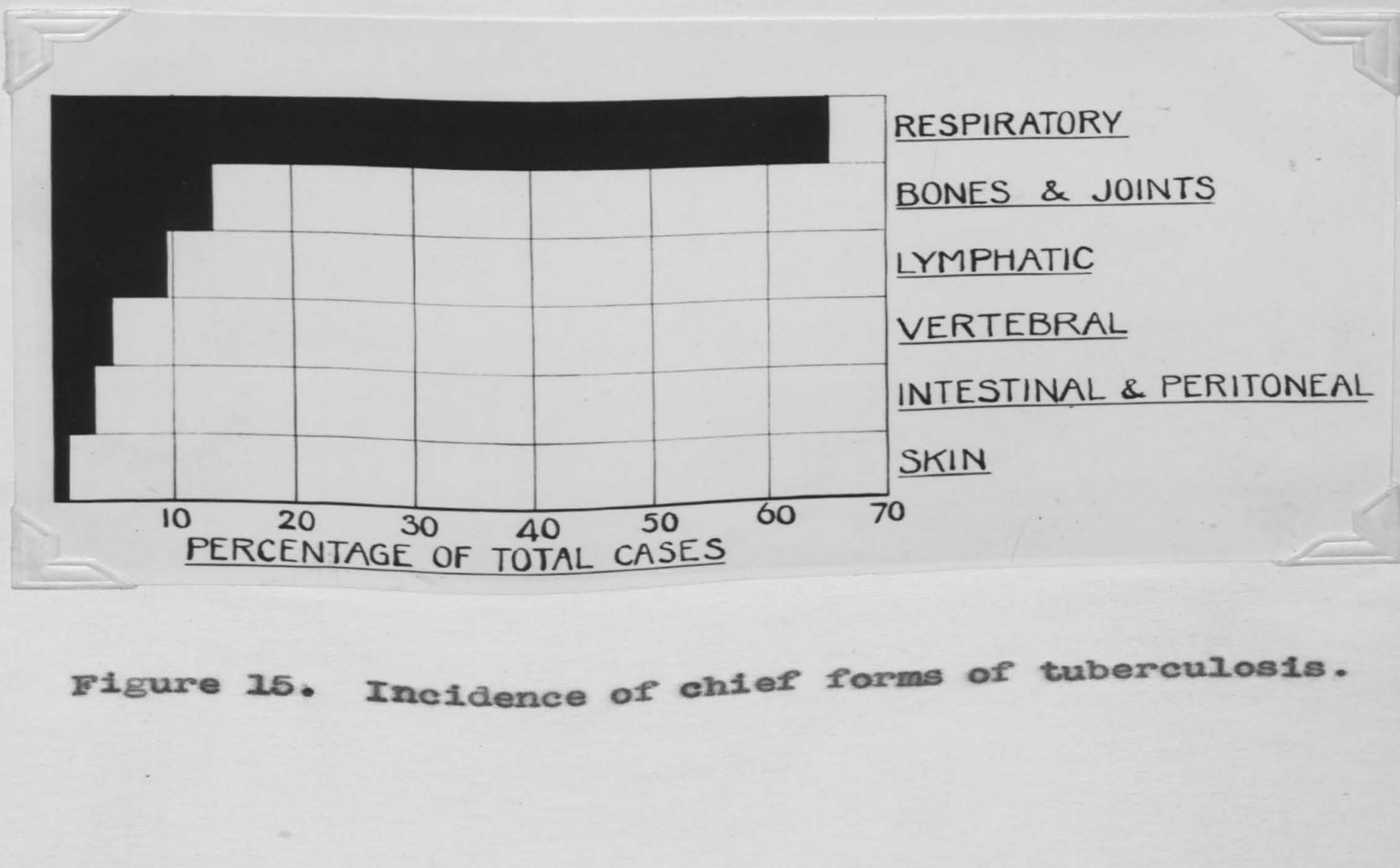

Figure 15. Incidence of chief forms of tuberculosis.

In dairy cattle, tuberculosis seems to have been always present. The first official veterinary examination of dairy herds in Shanghai was made in 1931 when no less than 89 animals were removed on account of the disease. In 1932 there were 46 cases and 43 in 1933. On each occasion the total number of animals in the herds numbered 1,600.

It was in 1930 that the Shanghai department commenced the periodical testing of raw milk for the presence of live bacilli. The specimens included both random samples and milk from suspected animals and gave the following results:-

1930	-	79 samples	-	8.6% positive.
1931	-	69 samples	-	11.7% positive.
1932	-	64 samples	-	14.1% positive.
1933	-	24 samples	-	23.8% positive.

This high incidence of infected milk coupled with the fact that in the tuberculin testing of 1,609 (representing practically all) dairy animals in 1932, there were 1,278 (79 per cent.) positive reactions, fully indicates the seriousness of tuberculosis among dairy cattle in Shanghai.

In view of the above, the relative absence of tuberculosis in native cattle is striking. In 1933 the Shanghai municipal abattoir slaughtered 40,402 oxen from the provinces of Kiangsu and Chekiang and found only three carcases infected with tuberculosis to such a degree as to necessitate rejection. In addition there were only 18 cases of localised tuberculosis, giving a total incidence of .04 per cent. tuberculosis in oxen killed at the municipal abattoir during 1933. Findings during

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TABLE 21 : THE PERCENTAGE INCIDENCE OF THE CHIEF FORMS OF TUBERCULOSIS BY REGIONS.

Type	North China			Yangtze Region			South China			Total Area		
	Male	Female	Persons	Male	Female	Persons	Male	Female	Persons	Male	Female	Persons
1. Respiratory	52.34	39.59	48.09	73.80	63.81	70.92	61.01	55.27	58.58	68.92	58.07	65.49
2. Intestinal and Peritoneum	3.97	4.69	4.31	2.45	5.10	3.21	3.87	4.55	4.16	2.86	4.93	3.51
3. Vertebral Column	6.42	6.94	6.59	3.79	3.26	3.64	4.81	5.64	5.16	4.33	4.34	4.33
4. Bones and Joints	19.76	24.69	21.40	9.48	11.18	9.97	16.96	16.55	16.78	11.99	14.50	12.78
5. Skin and Sub-cutaneous Tissue	.61	1.02	.75	.62	1.47	.86	.93	2.91	1.77	.65	1.67	.97
6. Lymphatic	11.81	21.22	14.94	6.92	12.10	8.42	6.94	12.73	9.39	7.69	13.77	9.61
7. Central Nervous	1.02	.61	.88	.44	.87	.56	2.27	1.71	2.00	.75	.97	.82
8. Urino-Genital	3.26	.20	2.24	1.72	.71	1.43	1.60	.36	1.08	1.94	.56	1.51
9. Other Forms	.71	1.03	.89	.77	1.41	1.00	1.60	.29	1.08	.89	1.22	.98
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total Cases	982	490	1,472	4,535	1,843	6,378	749	550	1,299	6,266	2,883	9,149

the first six months of 1934 have confirmed these figures. Among the 29,185 calves and 113,649 sheep slaughtered from 1932 to the middle of 1934 not a single case of tuberculosis was found and only two cases (which had both been kept for a considerable time in local dairy herds) of advanced tuberculosis were discovered amongst 1,189 buffaloes killed during eighteen months. The incidence in pigs was somewhat higher, being .55 per cent. of more than a million pigs examined during 1932-1934.

In Hongkong (13) the situation has been similar. Since 1910 between 30,000 and 60,000 cattle and between 200,000 and 300,000 pigs have been slaughtered annually, and in this period, although tuberculosis was frequently discovered in dairy cattle, only one case, the second in the history of the colony, occurred in native animals. Infected pigs were slightly more numerous than in Shanghai.

The evidence provided by Shanghai and Hongkong proves that dairy cattle and dairy products are seriously infected, but that native cattle, buffaloes and sheep are extremely rarely, and pigs but slightly so. In view of the above evidence it must therefore be admitted that it is somewhat difficult to ascribe a high incidence of bone, abdominal and glandular tuberculosis to the presence of bovine strains. One feature of interest may be pointed out in the age-old Chinese custom of butchers inflating carcases (pigs in particular) by mouth, thereby rendering possible transmission of tuberculosis and other diseases. From this evidence it is seen that tuberculosis in China

presents/.....

presents very different epidemiological problems from those existing in Europe.

Regional Incidence of Principal Types.

In Table 21 the incidence of the chief forms of tuberculosis for each of the three regions is given in the form of percentages of the total number of tuberculous patients. Respiratory tuberculosis forms 48 per cent. of all tuberculosis in the North as against 71 per cent. and 58 per cent. in the Yangtze Region and South China, which bears out Chun's argument (11) that proceeding south to north one sees a progressive increase in the proportion of non-respiratory forms. The regional difference in incidence of respiratory forms is balanced by the higher incidence of tuberculosis of the vertebral column, bones and joints and lymphatic system, in North China. Tuberculosis of the intestine and peritoneum and of the skin and subcutaneous tissue have a somewhat similar incidence in the three regions according to the present investigation.

Sex Incidence.

The sex distribution of the present group of hospital patients has been discussed in a previous chapter and the striking fact of roughly two males to one female seeking treatment was discussed which is approximately the ratio of male to female tuberculous patients in North China, the Yangtze Region and South China. The incidence of the chief forms of the disease is interesting as respiratory tuberculosis has a decidedly higher

incidence/.....

incidence in the male than in the female - 68.9 per cent. against 58 per cent; lymphatic tuberculosis is the type which is especially more common in the female. In all the three regions tuberculosis of the lymphatic system is relatively twice as common in the female as it is in the male. Tuberculosis of the vertebral column shows little difference in the sexes in the three regions, but tuberculosis of the bones and joints affects a higher proportion of females relative to males in North China than in either the Yangtze Region or South China.

Age Distribution.

The age distribution in percentage form for each condition is given in Table 22 and Figure 16.

(a) Respiratory tuberculosis: In both males and females the largest number of cases occurs in the age group 15-24 years, and the next largest number in the following age group 25-34 years. The percentage of female cases in the two youngest age groups 0-4 and 5-14 years is distinctly higher than that of male cases which is balanced by the higher percentage of male cases in all following age groups.

(b) Non-respiratory tuberculosis: The distribution has its major difference from that of respiratory tuberculosis in the greater numbers occurring in the youngest age groups 0-4 and 5-14 years. This is true of both sexes and is in keeping with the age incidence of non-respiratory tuberculosis as recorded from other parts of

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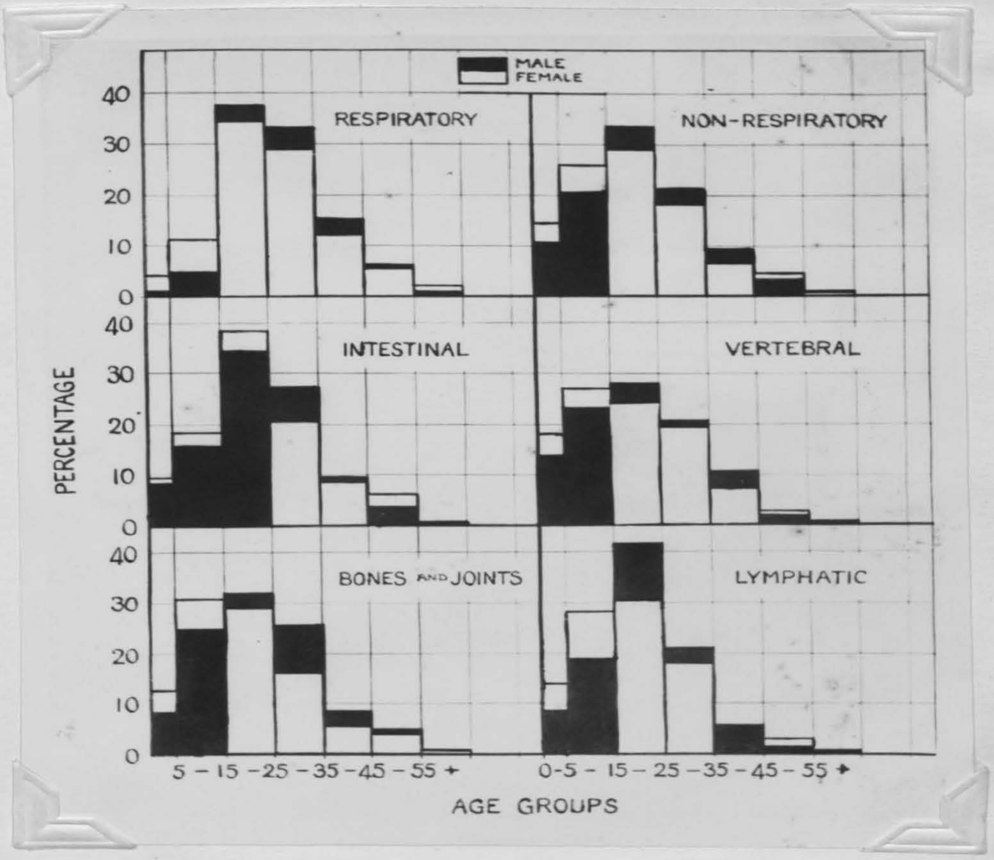

Figure 16. The age distribution of the chief forms of tuberculosis.

the world. The sex differences in this group repeat those observed in the respiratory group as the females have a larger proportion in the two youngest age groups than the males, resulting in the male proportions being larger than the females in the older age groups.

(c) <u>Intestinal and alimentary tuberculosis</u>: In both male and female the largest proportion of cases occurs in the age groups 15-24 years, the next largest in the age group 25-34 years, and the third largest in the age group 5-14 years. An interesting difference from respiratory tuberculosis lies in the fact that the proportion of females occurring in the age group 15-24 years is larger than that of males.

(d) <u>Tuberculosis of the vertebral column</u>: There is a much more even distribution of the percentage of cases in each group than in the three previous types discussed. The proportion of cases occurring in the youngest age groups 0-4 years and 5-14 years is therefore relatively high, being 13.86 per cent. and 23.02 per cent. in the males and 18.31 per cent. and 27.70 per cent. in the females. A second point of importance is that the largest proportion of female cases is in the age group 5-14 years, while the largest proportion of male cases resembles the other types by being in the age group 15-24 years.

(c) <u>Tuberculosis of bones and joints</u>: This group resembles that of the vertebral column group in being more evenly distributed over the various ages. The proportion of female cases is more

concentrated/.....

TABLE 22 : THE PERCENTAGE AGE AND SEX INCIDENCE OF THE CHIEF FORMS OF TUBERCULOSIS.

Disease	0 -		5 -		15 -		25 -		35 -		45 -		55 & over		Total		Total No. of Cases.	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1. Respiratory	1.39	4.18	4.65	11.64	37.62	34.34	33.43	29.03	15.27	12.78	6.01	5.57	1.58	2.45	100	100	6,087	2,370
2. Non-Respiratory	10.08	13.91	20.53	26.85	33.57	29.38	21.34	18.06	9.46	6.73	3.87	4.20	1.16	.86	100	100	2,845	1,739
3. Intestinal & Peritoneal	8.43	9.27	15.33	17.74	34.10	38.71	27.20	20.16	9.96	8.47	3.83	5.65	1.15	-	100	100	261	248
4. Vertebral Column	13.86	18.31	23.02	27.70	28.22	23.94	20.54	19.72	10.89	7.04	2.72	2.82	.74	.47	100	100	404	213
5. Bones & Joints	8.28	12.25	24.30	30.80	31.68	29.13	20.61	16.51	8.73	5.57	5.04	4.45	1.35	1.30	100	100	1,111	539
6. Lymphatic	8.83	13.18	18.77	28.16	41.95	30.33	20.98	17.87	6.31	6.32	2.37	3.79	.79	.36	100	100	634	554

concentrated, however, in the youngest age groups than the proportion of male cases, with the consequence that the percentage of female cases is higher than that of male cases, not only in the age groups 0-4 years and 5-14 years, but also in the age group 15-24 years.

(f) Tuberculosis of the lymphatic system: The striking feature of this distribution is the large proportion of male cases in the age group 15-24 years, forming 41.95 per cent. of all male cases. The percentage of female cases occurring in the two youngest age groups 0-4 years and 5-14 years is again higher than the percentage of male cases.

Discussion of Age Distribution.

It should be remembered that the age distributions described in the above six forms of tuberculosis are percentages of total cases of each condition, and are not morbidity rates based on a standard population. They must also, in forming an idea of their value as an index of the actual conditions, be linked with the age distribution of the general hospital population examined in a previous chapter and shown to have the largest number of both male and female patients in the groups of adolescents and young middle-aged.

If the graphs of Figure 16 are compared with Figure 6 in Chapter VIII, it is seen that in the case of:-

(a) Respiratory tuberculosis - the percentage incidence is higher in the age groups 15-24 years and 25-34 years, and proportionately lower in

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the older age groups than in the general hospital population.

(b) <u>Tuberculosis of the vertebral column, bones and joints, and the lymphatic system</u> - the percentage incidence is higher in the youngest age group than in the general hospital population.

(c) <u>Tuberculosis of the intestine and peritoneum</u> - the percentage incidence is roughly similar in both.

This extremely crude relationship gives a rough index of the age incidence of these forms in the general population. Tuberculosis of the respiratory system and of the intestine and peritoneum have their chief effect on adolescents and young middle-aged, while tuberculosis of the non-respiratory groups falls more heavily on the age group 5-14 years. When the four chief forms of non-respiratory tuberculosis are considered separately, it is seen that in tuberculosis of the vertebral column and bones and joints, the peak of the age incidence is probably about five to six years.

A comparison of the present material is possible with hospital patients from Canton given by Oldt (7). There are some differences. The pulmonary group of Canton gives a curve of age distribution rising in early adult life and being sustained at the same level more or less throughout the remaining periods. The non-pulmonary group has its highest rate in Canton in "childhood during the 5-9 year period with a sharp drop to the 20-24 year period".

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On the other hand Oldt discovered the same sex picture when he notes that in both pulmonary and non-pulmonary forms of tuberculosis the rate for females is higher than that for males up to the 30-34 year period and after that it is higher for males.

Ukil (14) gives a graph of the percentage age incidence of cases of the three chief tuberculous conditions seen in the polyclinics in Calcutta which bears a strong resemblance to the Chinese age distribution described in the present report, and his statement applies fairly accurately to the Chinese cases. It is as follows:- It will be seen that between the ages of 1 to 10 years, glandular and bone tuberculosis are the chief forms, of which again bone and joint tuberculosis has a higher incidence. From 10-15 years lung tuberculosis occurs a little more frequently, but it is much less common that the other two forms, whose curves steadily rise till they reach their maximum at the age of 30 years, after which there is a sharp decline. It will be seen that lung tuberculosis also follows a parallel curve from 15 years onwards, that of females rising and falling earlier then in males. Primary intestinal tuberculosis and tabes mesenterica occur between the ages of 25-35 years."

Curiously different from the age incidence of Chinese cases is that of the natives of the Dutch East Indies as described by de Langen (10). He remarks that:- "An important observation as to the age tuberculosis sets in. I very seldom

saw/.....

saw tuberculosis in native children, in general it is an exception when we see it before puberty. After the 20th or rather after the 30th year tuberculosis is most frequent. Even in very old age I saw a considerable number of tuberculosis. My impression is that in general in the Indies we see tuberculosis at an older age than in Europe."

Summary.

1. The analysis of all new patients attending a group of representative hospitals in the majority of the provinces during 1933 demonstrated the importance of tuberculosis with an incidence of 4.9 per cent. in 208,045 total patients.

2. Respiratory tuberculosis formed 65.5 per cent. of all tuberculous patients, a proportion agreeing closely with an Indian series from Calcutta living under very similar conditions to the Chinese, but different from a Dutch East Indies group where respiratory tuberculosis formed 85 per cent. Non-respiratory tuberculosis is relatively less frequent in South than in North China.

3. Lymphatic, skeletal and intestinal tuberculosis is not inconsiderable, but none of it is to be ascribed to bovine or porcine sources.

4. Some interesting sex differences occur in the various forms. Respiratory tuberculosis is relatively more frequent in the males, but lymphatic tuberculosis is especially common in females.

5. The age distribution indicates that respiratory tuberculosis and intestinal tuberculosis have their most marked incidence in the age group 15-34 years; that lymphatic and skeletal tuberculosis are the most prominent forms in the age group 0-14 years. This age distribution is another parallel with the Indian series from Calcutta.

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CHAPTER XII.

VENEREAL DISEASES.

Venereal diseases, it has been seen, formed the chief infectious disease group reported by the Survey hospitals and were fourth in the list of all disease conditions; skin conditions, injuries, and digestive conditions being of greater numerical importance. This relationship is illustrated in Table 23 constructed from the seventeen hospitals which returned complete records throughout 1933, giving 6.2 per cent. of all patients, both ward and clinic, as seeking hospital treatment for venereal disease.

The remaining eleven hospitals did not return complete records, but in a consideration of the nature of the venereal diseases as distinct from their relative proportion to other conditions, their data are of value and are included in this report. Venereal disease formed 7.3 per cent. of 40,677 patients seen in this second group of hospitals. All twenty-eight hospitals are listed in Table 24 which gives for each the number of cases of gonorrhoea, of syphilis, of total venereal disease and of total patients of both sexes during 1933. The total venereal disease cases in each hospital are also expressed as a percentage of the total number of patients of all kinds seeking treatment during the year. This column does not reveal any geographical differences of significance between the hospitals of North China and those of the Yangtze Region or South China.

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TABLE 23 : INCIDENCE OF PRINCIPAL CONDITIONS IN 17 SURVEY HOSPITALS.

Disease Title	Skin & Cellu-lar Tissue	Violence or Injuries	Digestive	Venereal	Tuber-culosis
No. of Cases	45,186	22,426	15,935	12,943	10,263
Percen-tage of Total Cases	21.7	10.8	7.7	6.2	4.9

TABLE 24 : THE NUMBER OF CASES OF (a) GONORR
ALL PATIEN

Region	Hospital	Gonorrhoea			
		M	F	P	M
North China	Peiping Union Medical College	13	6	19	73
	Severance, Seoul	409	79	488	311
	Mackenzie, Tientsin	35	5	40	32
	Cheeloo, Tsinan	238	19	257	360
	General, Changte	27	1	28	43
	Menzies, Hwaiking	112	20	132	156
	St. Paul's, Kweiteh	112	12	124	134
Total		946	142	1,088	1,109
Yangtze Region	Bethesda, Siangyang	50	16	66	89
	Methodist, Teian	11	1	12	21
	Christian, Suchowfu	219	2	221	673
	Hudson Taylor, Changsha	249	116	365	312
	Yale, Changsha	239	53	292	266
	Methodist, Hankow	128	18	146	173
	Union, Hankow	187	27	214	202
	Methodist, Wusueh	30	12	42	31
	General, Nanchang	196	18	214	185
	General, Wuhu	94	16	110	139
	University, Nanking	481	122	603	347
	General, Changteh	179	18	197	281
	C.R.C., Shanghai	131	8	139	88
	Lester, Shanghai	1,074	70	1,144	704
	Kwangchi, Hangchow	513	161	674	453
Total		3,781	658	4,439	3,964
South China	Presbyterian, Hengchow	164	9	173	351
	Hope, Kulangsu	38	20	58	30
	Mission, Swatow	68	45	113	130
	Government, Hong-kong	10	7	17	56
	General, Canton	69	28	97	126
	C.M.S., Yunnanfu	297	84	381	230
	Total	646	193	839	923
	Grand Total - All Hospitals	5,373	993	6,366	5,996

The highest incidence recorded was that of the Menzies Memorial Hospital, Hwaiking, where 15 per cent. of all patients were reported to be attending hospital for venereal disease treatment, and the lowest incidence was that of the Peiping Union Medical College Hospital with 1.9 per cent., but in this case only in-patient records were received. The incidence for the total twenty-eight hospitals was 6.4 per cent. of 248,722 patients.

It should be remembered that the card record made of each patient, required as diagnosis that condition which induced the patient to seek treatment, i.e. only so-called primary diagnoses have been considered in the analysis, and it can be confidently estimated that the incidence of venereal disease would reach an even higher figure if it had been possible to perform blood tests and include secondary diagnoses. In the present series the incidence of 6.4 per cent. of venereal disease means that 6.4 per cent. of all patients sought treatment for active conditions diagnosed as directly due to venereal disease.

The Relative Incidence of Gonorrhoea and Syphilis.

In the whole group of 248,722 patients, the number of gonorrhoeal cases numbered 6,366 or 2.6 per cent. and the number of syphilitic cases numbered 8,205 or 3.3 per cent. Syphilis, besides being more prevalent than gonorrhoea in the whole group, also outnumbered gonorrhoea in each of the three regions, North China, Yangtze Region and South China as shown in Table 24.

Wu/.....

Wu Lien-teh (1) gives tables of venereal disease admissions to hospitals and clinics of Hongkong, Shanghai and Manchuria, which returned a similar preponderance of syphilitic patients over gonorrhoea patients. Suriyabongs (2) tabulates the total cases of venereal disease in the hospitals of Bangkok and here again syphilis (6,192 cases) was seen more frequently than gonorrhoea (3,097 cases). This author points out that amongst the Siamese gonorrhoea is not considered a serious affection and this neglect explains the higher incidence of syphilis in hospitals, though other evidence would postulate gonorrhoea being twice as prevalent as syphilis in the country as a whole.

Some such outlook with regard to the two venereal diseases exists amongst the Chinese who also appreciate that modern hospitals possess in salvarsan and its derivatives a powerful weapon for banishing the unpleasant features of syphilis, but have no dramatic treatment for gonorrhoea. It is interesting, therefore, to turn to Western populations for relative figures and to note that in Australia of 14,175 cases of venereal disease 11,220 were gonorrhoea and only 2,315 were syphilis (3).

The returns issued by the Ministry of Health were 8,583 cases of gonorrhoea and 6,029 cases of syphilis for the clinics of England during 1933 (4).

Sex/.....

Sex Incidence.

The total number of male cases of venereal disease was 12,553 and of female cases 3,426 in the twenty-eight hospitals as shown in Table 24, giving a ratio of over three males to one female. This is considerably higher than the general hospital ratio of males to females which, as has been previously mentioned, was two to one.

A study of the sex differences in the case of the individual diseases is of interest as in the case of gonorrhoea 5,373 males and 993 females sought treatment, a ratio of over five males to one female. In the case of syphilis the ratio is 5,996 males to 2,209 females or 2.7 males to one female, Table 25. These results are in keeping with sexual differences in the two diseases, as gonorrhoea is even less alarming to the female than it is to the male. It is worth while noting for comparison that in the report of the Chief Medical Officer quoted above (4) the ratio of males to females in the case of gonorrhoea in England was only slightly higher than three males to one female, while Stallybrass (5) says that "among the patients treated at the clinics for the diseases in Liverpool during 1925-27, the males were 2.7 times as numerous in the case of gonorrhoea as the females".

Regional Incidence.

From Table 25 it is clear that there is no striking regional difference of the sex ratio in

gonorrhoea/......

TABLE 25 : THE NUMBER OF CASES OF GONORRHOEA AND SYPHILIS BY REGIONS AND BY PERCENTAGE OF TOTAL PATIENTS, MALE AND FEMALE.

Hospitals		Gonorrhoea			Syphilis			Total Patients		
		Male	Female	Total Persons	Male	Female	Total Persons	Male	Female	Total Persons
North China	Cases	946	142	1,088	1,109	399	1,508	31,429	16,158	47,587
	Percentage	3.0	0.9	2.3	3.5	2.5	3.2	100	100	100
Yangtze Region	Cases	3,781	658	4,439	3,964	1,295	5,259	108,502	43,200	151,702
	Percentage	3.5	1.5	2.9	3.7	3.0	3.5	100	100	100
South China	Cases	646	193	839	923	515	1,438	28,016	21,417	49,433
	Percentage	2.3	0.9	1.7	3.3	2.4	2.9	100	100	100
Total Hospitals	Cases	5,373	993	6,366	5,996	2,209	8,205	167,947	80,775	248,722
	Percentage	3.2	1.2	2.6	3.6	2.7	3.3	100	100	100

gonorrhoea. In North China male gonorrhoea cases formed 3 per cent. of all male patients, while in the Yangtze Region and South China they formed 3.5 per cent. and 2.3 per cent. respectively. The female percentage was 0.9 both in North and South China and 1.5 in the Yangtze Region. Therefore, though absolute figures gave a sex ratio of approximately six males to one female in North China and the Yangtze Region, and a ratio as low as three males to one female in South China, the percentage incidence on the other hand does not show such a great disparity of the ratio in the three regions.

The incidence of male syphilis was 3.5 per cent. of all male patients in North China, 3.7 per cent. in the Yangtze Region and 3.3 per cent. in South China. Female syphilis gave corresponding figures of 2.5 per cent. for North China, 3.0 per cent. for the Yangtze Region and 2.4 per cent. for South China. The sex difference of incidence is thus approximately the same in the three regions.

Seasonal Incidence.

The influence of the seasons on the admissions of all types of patients is appreciable. In January and February numbers are at their lowest, but reach their peak with the heat in the summer months of July and August as the analysis given in a previous chapter revealed.

Venereal disease monthly incidence seems to be best expressed with regard to the present data

by/.....

by taking cases of primary chancre and cases of gonorrhoeal urethritis. The conditions of the Survey did not allow of detailed histories being made such as notes of the duration of infection or date of exposure to infection. Consequently only the very rough index given by the two conditions mentioned can be used, and these were considered only in those seventeen hospitals which returned complete records throughout the year.

The <u>seasonal distributions</u> of cases were as follows:-

Month	Gonorrhoeal Urethritis	Primary Chancre
January	120	77
February	159	71
March	216	95
April	207	87
May	241	97
June	241	101
July	186	107
August	248	116
September	217	106
October	191	113
November	218	103
December	167	92

These figures are given in graphical form in Figure 17. Gonorrhoeal urethritis has a shorter incubation period and generally this period is subject to less extreme variations than that of primary chancre. Such facts probably enter into the explanation of the seasonal curve differences. The curve of primary chancre shows

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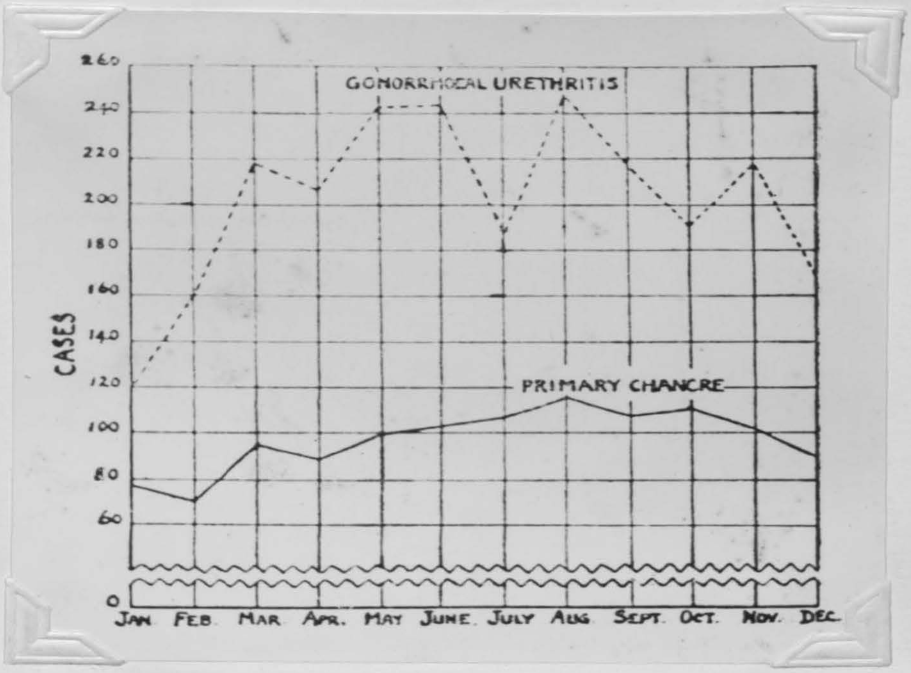

Figure 17. The seasonal distribution of gonorrhoeal urethritis and primary chancre.

the same rise during the summer months as occurs in gonorrhoeal urethritis but this rise is much less and not so dramatic. Stallybrass (6) gives curves for gonorrhoeal and primary syphilitic seasonal distribution in Sweden which are dissimilar to the Chinese in that gonorrhoea in Sweden shows its greatest prevalence in autumn and syphilis in winter.

Types of Infection.

The constant plea of the statistician is for complete, concise records, but it is rarely possible to obtain them. Imperfect records are inevitable in a large voluntary collective investigation. The present enquiry has been gratifying in the steady co-operation shown over two years under most trying conditions, but it is a matter of regret that, largely owing to the peculiar difficulties facing hospitals in a country such as China, the analysis of the data loses much of its value from the incompleteness of the records.

Venereal disease returns have too often given no indication of the exact condition present; unqualified diagnoses such as "syphilis", "gonorrhoea", "secondary syphilis" leave much to be desired. Several attempts were made to seek improvement, but the response was slow. It is for this reason that the subdivisions of gonorrhoea and syphilis presented in Table 26 are so unsatisfactory. In both these diseases the number of unqualified diagnoses forms an appreciable proportion of all returns. That most

of/.....

TABLE 26 : CLASSIFICATION OF VENEREAL DISEASE RETURNS.

Disease	Types	Cases		
		M	F	P
Gonorrhoea	Urethritis	2,742	70	2,812
	Epididymitis	244	-	244
	Female Genital	-	440	440
	Arthritis	323	88	411
	Conjunctivitis	210	73	283
	Other Forms	325	21	346
	Unqualified	1,529	301	1,830
	Total	5,373	993	6,366
Syphilis	Chancre	1,439	-	1,439
	Cardiovascular	67	17	84
	C.N.S.	289	35	324
	Bone	60	40	100
	Secondary	364	211	575
	Other Forms	1,308	810	2,118
	Unqualified	2,469	1,096	3,565
	Total	5,996	2,209	8,205
Mixed V.D.		553	102	655
Other Forms V.D.		631	122	753
Grand Total V.D.		12,553	3,426	15,979

of the unqualified gonorrhoeal cases are simple acute urethritis, and perhaps the majority of the unqualified syphilitic cases are primary chancre, can be confidently hazarded, but nevertheless it is problematical whether the relative incidence of the different subdivisions is given by the numbers of classified diagnoses returned. These subdivisions for the reasons just advanced had to be broad and limited to only the more important types of each condition.

In the case of gonorrhoeal returns giving qualified diagnoses, urethritis in the male and genital infections in the female, naturally predominated, but arthritis and conjunctivitis were fairly frequent in both sexes. Epididymitis was the diagnosis given in 244 cases of the male returns.

No syphilitic chancres in females were reported, but numbered 1,439 in the male. Conditions of the nervous system, including tabes dorsalis, general paralysis of the insane, syphilitic neuritis, myelitis and meningitis, were amongst the most prominent forms among the non-primary manifestations recorded. Diagnoses of cardiovascular and bone syphilis were relatively few.

Mixed infections of gonorrhoea, syphilis and soft chancre were few, numbering only 553 out of 12,553 male venereal disease cases, and 102 out of 3,426 female cases.

The term "Other Forms" used in the classification in Table 26 refers chiefly to soft chancre

infections/.....

infections, and these were 631 in the males and 122 in the females.

Disappointingly incomplete though the sub-classification of the venereal disease returns is, yet importance is to be attached to some facts demonstrated by the analysis. The proportion of "Other Forms of Venereal Disease", i.e. chiefly soft chancres, is roughly similar to the incidence of these conditions in other countries. Again the relative frequency of the various gonorrhoeal complications, though not given perhaps accurately by the figures in the present report, does indicate that gonorrhoea in the Chinese is not the simple disease lacking sequelae which some writers have claimed. Epididymitis, conjunctivitis and arthritis, and infections of the female genital system have been reported from hospitals all over the country. It is of interest here to quote from a letter received from Dr. McClure of Hwaiking, one of the medical officers co-operating in the Survey. He says:- "Our cards this time show a heavy lot of G.C. eyes. This is due to some 40 odd cases coming down to us from the 41st army over in Shansi. The first lot of 26 men came over a very rough mountain pass with one man who could see. They each hung on to the overcoat tail of the man in front, and came through very, very dangerous mountain paths. No one fell over, thank fortune. On the plains they walked three abreast, the outside ones touching the shoulders of the man in the centre, who held on in turn to the shoulders

of/.....

of the man in front. The front centre could see and the rest were all blinded. Of 26 there were ten odd who were hopelessly blind, and the rest all lost one eye."

Syphilitic disease of the nervous system was one of the most frequent forms recorded, another difference from an often expressed view that nervous manifestations of syphilis are rare in the Chinese.

Age Incidence.

It was considered that the nature of the material justified analysis of age incidence only in the groups given in Table 27 and Figure 18. Owing to the small numbers of females in these groups they have not been included.

The primary conditions, gonorrhoeal urethritis and primary chancre, give practically identical age distributions, the highest percentage of cases occurring in the age group 25-34 years, and over 75 per cent. of cases being included in the group of adolescents and young middle-aged, i.e. the age group 15-34 years. This accords with the period of greatest sexual activity. When considered in relationship with the age distribution of the general hospital population discussed previously, it is seen that venereal disease patients show greater concentration in these particular age groups of early adult life than the general hospital population, an indication in the absence of standardised morbidity rates, of the similarity of the onset of venereal disease

in/.....

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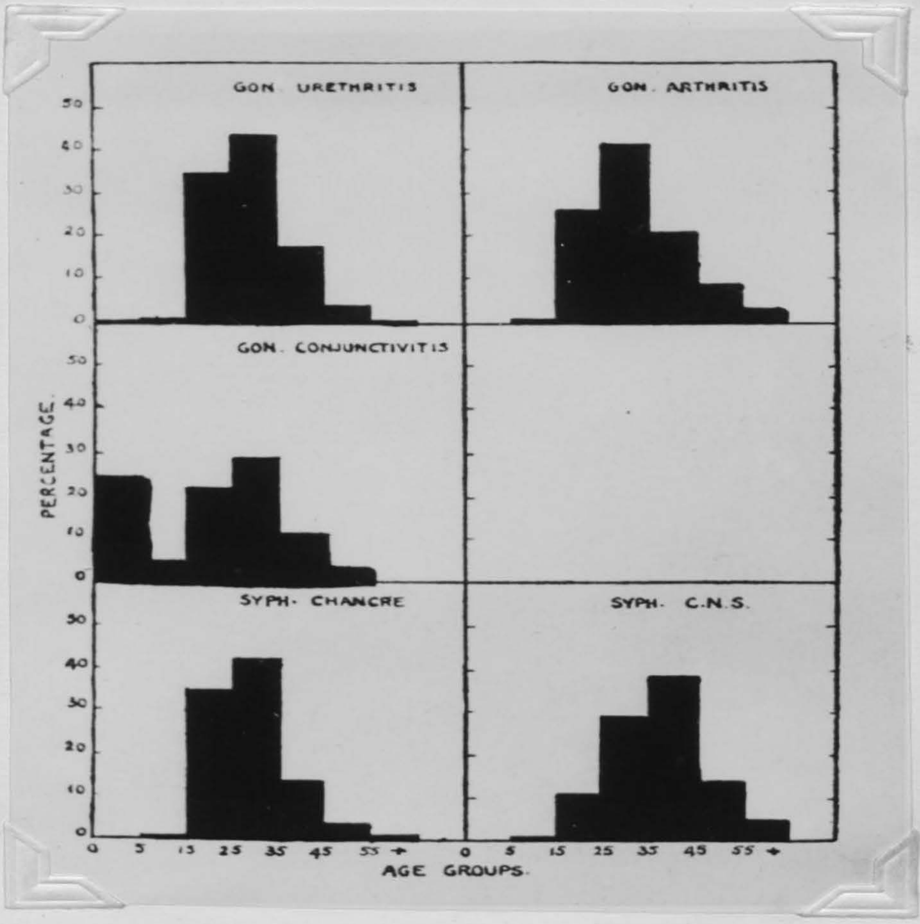

Figure 18. The age incidence for males of the chief forms of venereal disease.

in the Chinese to other races.

Gonorrhoeal arthritis gives the age distribution which would be anticipated from a knowledge of its clinical history. Cases seem to be more frequent in the older age groups than is the case with the primary form of the disease, urethritis, but the greatest number of cases is, however, in the same age group, 25-34 years.

Gonorrhoeal conjunctivitis has two concentrations in its age distribution, one equivalent to ophthalmia neonatorum, being in the age group 0-5 years, and numbering 26 per cent. of all cases, and the other corresponding to the adult type of the disease, being in the age group 15-34 years. The percentage in this group is unusually high, including 52.91 per cent. of all cases. The adult form of the disease is usually associated with conditions of dirt and carelessness and consequently the high percentage in the Chinese coming under hospital observation is not at all surprising. It is a particularly dangerous form of eye affection and undoubtedly to be considered as a serious cause of the great amount of blindness and general ophthalmological disease seen in the country.

Syphilis of the nervous system gives the age distribution to be expected when it is seen that the highest percentage of cases occurs in the age group 35-45 years.

Discussion/.....

TABLE 27 : THE PERCENTAGE AGE INCIDENCE IN MALE PATIENTS OF THE CHIEF FORMS OF VENEREAL DISEASE.

		0 -	5 -	15 -	25 -	35 -	45 -	55 +		Total Cases
Gonorrhoeal	Urethritis	.18	.55	33.92	42.67	17.66	4.29	.73	100	2,730
	Arthritis	-	.63	25.63	41.25	20.30	9.06	3.13	100	320
	Conjunctivitis	26.21	5.34	23.30	29.61	10.68	4.85	-	100	206
Syphilis	Chancre	.14	.49	35.15	42.82	15.69	4.67	1.05	100	1,434
	Central Nervous System	-	.35	11.50	29.27	38.68	14.98	5.23	100	287

Discussion.

Venereal disease in China has many interesting epidemiological problems, its history perhaps especially so as the question of the duration of syphilis in China has a direct bearing on the entry of syphilis into Europe. Syphilis is generally believed to have entered China through Canton early in the Ming Dynasty, having been brought to the East by Portuguese sailors (7). Yet various types of chancre mentioned by Wong (8) were known to the ancient Chinese physicians and it seems questionable whether soft chancre explains them all. Syphilis existing from time immemorial in China would strengthen an argument against a New World source of the disease in Europe. Whatever the length of time syphilis has existed in China it is undoubtedly now disseminated throughout the population. The evidence of heavy incidence in hospital populations and Wassermann positives in various groups given by Wu (1) is amply confirmed by the present study.

The present survey goes further in demonstrating that in urban populations as seen in hospitals throughout the land, both gonorrhoea and syphilis are similarly prevalent. Since the revolution in 1911 the wide dissemination of venereal disease has been one of the many unfortunate ravages wrought by numerous civil wars. A passage has already been quoted above which is a striking example of how wandering soldiers carry the infection.

In/.....

In interpreting the figures given in the present report of syphilitic and gonorrhoeal incidence in hospital patients, various factors must be borne in mind. Gonorrhoea is no more treated seriously by the average Chinese than it is by most peoples, while syphilis holds but a little better position. The people, however, have become aware of the cures produced by occidental drugs unobtainable by their own pharmacopoeial mixtures and realise that injections of salvarsan have apparently miraculous powers of relieving symptoms. Thus Chinese patients suffering from venereal disease turn towards Western medicine for treatment, when with other conditions they still rely upon their own herbalists.

On the one hand, therefore, because of a light-hearted attitude, patients are not likely to seek treatment at all, and on the other, there is the attraction of the salvarsan and other scientific methods of treatment. Whether these factors balance or not, the place held by active venereal disease in hospitals is serious enough, and the present report has further demonstrated that such crippling complications as arthritis and conjunctivitis due to gonorrhoea, and nervous and bone manifestations of syphilis, are by no means negligible.

<u>Summary</u>.

1. Venereal disease represented 6.2 per cent. of all new patients, i.e. combined in-patients and out-patients, seen in seventeen hospitals returning complete records during 1933. This does not

exhaust/.....

exhaust the venereal disease incidence as only primary diagnoses were reported.

2. In this group of hospital patients cases of syphilis outnumbered cases of gonorrhoea in each of the three regions, North China, Yangtze Region and South China.

3. The sex ratio was five males to one female in the case of gonorrhoea, and 2.7 males to one female in the case of syphilis.

4. Seasonal incidence of gonorrhoeal urethritis and primary chancre showed a minimum in January rising to a maximum in the summer months, June to August.

5. Owing to incomplete returns only a rough subclassification of gonorrhoea and syphilis was possible. Numbers of cases of gonorrhoeal arthritis and conjunctivitis, and of nervous manifestations of syphilis were reported from all areas.

6. The age incidence showed primary forms of syphilis and gonorrhoea most prevalent in adolescent and early adult life. Gonorrhoeal conjunctivitis had a high adult as well as a high infantile incidence.

7. Selective factors affecting the attraction of Chinese venereal disease sufferers to Western hospitals are discussed.

---

1. Wu Lien-teh. "The Problem of Venereal Diseases in China." Nat. Med. Jour. of China. 13: 109, 1927.

2. Suriyabongs, L. "The Prevalence of Venereal Diseases in Siam." Trans. 8th Congress Far East. Assoc. Trop. Med., Siam. 1: 206, 1930.

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3. "Venereal Disease in Australia, 1924." Health, Melbourne. 4: 56, 1926. Rev. Bull. Hyg. 1: 860, 1926.

4. Chief Medical Officer. "On the State of Public Health." Annual Report of the Chief Medical Officer of the Ministry of Health for 1933, 278.

5. Stallybrass, C. O. "The Principles of Epidemiology." George Routledge and Son, London. 347, 1931.

6. Stallybrass, C. O. "The Principles of Epidemiology." George Routledge and Son, London. 533, 1931.

7. Pollitzer, R. "The History of Certain Infectious Diseases in China." North Manchurian Plague Prevention Service Reports. 8: 134, 1929-1930.

8. Wong, K. Chimin. "Notes on Chinese Medicine." Chinese Med. Jour. 32: 347, 1918.

CHAPTER XIII.

DIPHTHERIA.

It is interesting to note in a recent article by Lee (1) that "the earliest mention of a disease which can be identified with a fair degree of certainty as diphtheria is to be found in Chuang Yang Chuan Shu written by Tau Han-Ching in thirteenth century in which a disease called Ch'ien Han Feng was mentioned".

At present diphtheria is well known and wide-spread in China with occasional severe epidemics such as that in Yunnan where 30,000 deaths are said to have occurred (2), and the outbreaks mentioned in a recent report of the National Epidemic Prevention Bureau (3) which occurred in 1926 in Shansi and Kiangsu.

Some data are also available of its relative importance as a cause of mortality and morbidity; for instance, in the Ting Hsien Experimental Area valuable statistics have been collected (4) and these show the following specific death rates:-

Measles	84.1 per 100,000.
Scarlet Fever	79.8 per 100,000.
Diphtheria	75.2 per 100,000.

Though Peiping is further north than Ting Hsien diphtheria is in the following figures given by Grant and Yuan (5) relatively less virulent:-

Scarlet Fever	80 per 100,000 deaths.
Measles	26 per 100,000 deaths.
Diphtheria	11 per 100,000 deaths.

In the central provinces figures are given for the Nanking municipal area which show that of 43,149 deaths in 1929-1933

Measles was responsible for 1,544
Diphtheria " " 513
and Scarlet Fever " " 30.

In 1933 of the 190,745 patients treated in the sixteen Survey hospitals throughout the country, diphtheria was diagnosed in 277 cases, being numerically greater than scarlet fever, 142 cases, and measles, 191 cases.

In 1934 of the 268,684 patients treated in the twenty-five Survey hospitals diphtheria was diagnosed in 420 cases as compared with 121 cases of scarlet fever and 517 cases of measles.

Its distribution was wide-spread as all of the sixteen hospitals reported it in 1933 and only the three hospitals at Siangyang, Teian and Wusueh did not see cases in 1934.

Seasonal Incidence.

This is given in the following table:-

Month	1933	1934
January	20	35
February	29	26
March	33	38
April	35	39
May	25	23
June	13	20
July	8	19
August	14	10
September	11	37
October	20	73
November	28	54
December	16	46
Total Cases	252	420

Diphtheria/.....

Diphtheria has an inverse seasonal incidence to the general hospital population which, as a previous chapter has demonstrated, reaches its highest numbers in the summer months of June, July and August. In both years the absolute numbers of diphtheria cases are lowest in summer, while in 1933 the greatest number of cases occurred in spring, and in autumn and winter in 1934.

Age and Sex Distribution.

The age and sex distribution for both years combined is given in Table 28.

The total hospital patients are all patients who attended the Survey hospitals, their age and sex distribution having been discussed in a previous chapter. In the total patients the sex ratio was 2.11 males to 1 female, while the diphtheria cases show 350 males and 322 females, an approximate ratio of 1.1 males to 1 female. However, the disparity of the sexes in the total hospital population has been shown to be due to the larger numbers of males in the young adult and middle-aged groups, and thus with this hospital background it may be legitimately concluded that there is no sex difference in the incidence of diphtheria.

From Table 28 it will be observed that the two sexes show but slight differences in the percentage age groupings which cannot be considered significant.

If/.....

TABLE 28 : PERCENTAGE AGE DISTRIBUTION BY SEX OF DIPHTHERIA CASES AND TOTAL HOSPITAL PATIENTS.

Age Group	Diphtheria		Total Hospital Patients	
	Male	Female	Male	Female
0 -	30.2	29.6	7.5	16.0
5 -	23.3	27.3	9.8	13.2
15 -	21.8	22.5	33.8	27.2
25 -	16.7	14.1	26.1	20.9
35 -	6.6	3.8	13.5	11.4
45 -	.9	1.0	6.4	6.9
55 +	.6	1.6	3.0	4.4
	100.0	100.0	100.0	100.0

If the diphtheria male age grouping is compared with the total male hospital cases age grouping, a marked difference is seen. Diphtheria has over 30 per cent. of its incidence in the under 5 years age group and over 50 per cent. under 15 years, while in the total hospital patients over 50 per cent. fall in the age group over 15 years. Similarly the female cases of diphtheria largely fall in the age groups under 15 years. This, of course, conforms with the expected age incidence of diphtheria as throughout the world this disease is a disease of childhood.

Geographical Distribution.

Maxwell (2) states that "diphtheria has a wide but rather uneven distribution in China. It is undoubtedly commoner in the north and central provinces than in the south, and we rather suspect that it is a disease of comparatively recent introduction to the tropical regions."

Percentage Incidence of Diphtheria Cases by Geographical Regions.

Region	1933 Percentage	1934 Percentage
South China	.12	.17
Yangtze Region	.12	.16
North China	.25	.13

Taking the hospitals in the three regional groups given in the above table the percentage

incidence/.....

incidence of diphtheria cases to all hospital cases is seen not to give any decisive geographical distinctions. The relatively high incidence in South China is explained, however, by the inclusion in this area of the Yunnan Hospital which returned 34 cases in 1933 and 36 cases in 1934, thus raising the percentage incidence of the area. This small group of Chinese diphtheria returns may thus be accepted as a further demonstration of the relation of incidence of clinical diphtheria to climatic zones.

Summary.

1. In 1933 diphtheria had a higher incidence than both scarlet fever and measles, but in 1934 measles cases were more numerous than those of diphtheria.

2. The seasonal incidence shows a peak incidence in spring or winter.

3. There are no sex differences and its age incidence is similar to that of other countries, being highest in early childhood.

4. Geographical differences were roughly as reported by previous authors, Yunnan giving an unusually high incidence.

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1. Lee, Tao. "A Short History of the Acute Infectious Diseases in China." Chinese Med. Jour. 50: 172, 1936.

2. Maxwell, James L. "Diseases of China." 2nd Edition, Shanghai. 21, 1929.

3. National Health Administration - National Epidemic Prevention Bureau, Peiping Report 1919-1934. 90.

4. Che'n, C. C. "Public Health in Rural Reconstruction at Ting Hsien." Annual Report, 1934.

5. Grant, J. B. and Yuan, I. C. "A Note on the Forces of Mortality and their Classification in Peiping." Chinese Med. Jour. 46: 1187, 1932.

CHAPTER XIV.

MEASLES.

According to Lee (1) "measles was first recognised in China by Chien Yi (1078-1085). But the first clear distinction between measles and smallpox was recorded in Tau Chen Fang Lun written by Chen Wen-Chung. It is believed that measles was a new disease in the eleventh century, because there are twenty different terms for measles in Chinese literature since the Sung Dynasty."

Curiously enough this disease has received scant recognition in the modern medical literature of China, but nevertheless in the Ting Hsien Experimental Area it has had a higher mortality than scarlet fever or diphtheria as is indicated in the following figures (2):-

Measles	84.1 per 100,000.
Scarlet Fever	79.8 per 100,000.
Diphtheria	75.2 per 100,000.

Measles is not a serious cause of morbidity in hospital populations in China as in the Survey during 1933 and 1934 only 180 cases in the first year and 517 cases in the latter year were recorded.

Seasonal Incidence.

The cases had the following monthly distribution:-

Month	1933	1934
January	2	29
February	7	51
March	10	87
April	17	111
May	34	83
June	32	50
July	19	43
August	16	25
September	11	8
October	9	11
November	12	8
December	11	11
Total Cases	180	517

This/.....

This evidence indicates that measles is a spring-time and early summer disease. It is to be remembered, however, that measles displays a fairly well established periodicity in other parts of the world not directly related to seasonal factors. Therefore in China two successive years are insufficient to allow of any estimate of the influence of season on this disease.

Age and Sex Distribution.

Table 29 gives the age and sex distribution of measles compared with the total hospital population distribution.

There is no sex difference of any significance in the age grouping. This age grouping, as was to be expected, shows a preponderance of cases in the early years. Fifty per cent. of all measles cases seen occurred in the age group 1-5 years in both male and female. The cases with ages over 25 years were negligible.

Geographical Distribution.

The percentage incidence of measles in the hospital groups as defined in Chapter X on the general incidence of disease was as follows:-

South China	.47 per cent. of all hospital cases.
Yangtze Region	.17 per cent. of all hospital cases.
North China	.06 per cent. of all hospital cases.

There is suggested here a geographical difference in the incidence of measles in China with a progressively lower incidence in proceeding from south to north. The figure for South China

is/.....

TABLE 29 : PERCENTAGE AGE DISTRIBUTION BY SEX OF MEASLES CASES AND TOTAL HOSPITAL CASES

Age Group	Measles		Total Hospital Cases : 1934	
	Male	Female	Male	Female
0 -	27.0	28.1	2.6	5.8
1 -	49.9	50.6	4.7	10.2
5 -	15.6	18.1	10.0	13.2
15 -	4.9	2.6	33.3	27.3
25 -	1.6	-	25.7	20.9
35 -	.5	.6	13.5	11.4
45 -	.5	-	6.9	6.9
55 +	-	-	3.3	4.4
	100.0	100.0	100.0	100.0
Total Number of Cases	385	310	183,131 + 2 no age given	60,858

is largely produced by the large number of cases reported by the Yunnan Hospital. This hospital reported both relatively and absolutely the largest number of measles of any institution of the survey.

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1. Lee, Tao. "A Short History of the Acute Infectious Diseases in China." Chinese Med. Jour. 50: 172, 1936.

2. Che'n, C. C. "Public Health in Rural Reconstruction at Ting Hsien." Annual Report, 1934.

CHAPTER XV.

SCARLET FEVER.

Previous Epidemiological Studies.

Wong and Wu (1) review the history of scarlet fever and indicate that the evidence suggests a modern origin in China, though the old-style practitioners in grouping all rashes and eruptive diseases together render clear recognition of specific conditions in their writings impossible. As the above authors suggest, the theory of a recent introduction is strengthened by a study of the records of the Shanghai Municipal Council analysed by Stanley (2), which demonstrate that until 1902 the infection was practically unknown amongst the Chinese and but sporadic in the European. In that year occurred the first epidemic involving over 100 Europeans and 1,500 Chinese. Waves of infection have appeared at intervals since and the disease is now endemic in this city (3).

The most comprehensive surveys of the problem in China are those conducted on behalf of the Manchurian Plague Prevention Service by Yang and Shih (4) and Lin and Jettmar (5). Brief reference to these studies will serve to introduce the present report. It was demonstrated that an increase in severity both in morbidity and mortality occurred on proceeding from South to North China. Further it was revealed that the disease affected the Chinese more seriously than the European. China

thus/.....

thus provides the same interesting problem of variation in scarlet fever distribution, incidence and virulence as shown in other parts of the world. Dick testing (6) as an index of susceptibility to haemolytic streptococci has given similar results in Harbin, Peiping and Shanghai, suggesting that variable susceptibility is not the cause of the geographical differences.

In the present chapter the records of the sixteen hospitals in 1933 and the twenty-five hospitals in 1934 which returned cards of all patients are examined.

Geographical Distribution.

It will be seen that scarlet fever as reported by the Survey hospitals had the incidence given in Table 30.

In Table 30 also are revealed several features concerning scarlet fever in China confirmatory of the previously recognised distribution. The hospitals are listed from south to north on proceeding down the list and thus it is seen that the absolute number of cases increases from the south through the Yangtze Region to the northern hospitals, with the exception of Yunnan. Further, only four out of sixteen hospitals in 1933 and nine out of twenty-five in 1934 did not report scarlet fever, indicative of the present-day wide distribution, whatever may have been the conditions at the beginning of the century.

Relative Incidence.

Though the numbers are unfortunately small it is useful to compare the incidence of scarlet fever

with/.....

TABLE 30 : CASE INCIDENCE OF SCARLET FEVER FOR 1933 AND 1934.

1933			1934		
Hospital	Cases Scarlet Fever	Total Hospital Patients	Hospital	Cases Scarlet Fever	Total Hospital Patients
Canton	1	9,379	Canton	1	7,263
Yunnanfu	10	15,299	Yunnanfu	25	17,439
Swatow	-	10,914	Swatow	-	10,074
Hengchow	-	7,668	Kulangsu	-	2,083
Changteh	1	5,375	Foochow	1	5,905
Hangchow	15	18,767	Hengchow	-	6,364
Lester, Shanghai	13	44,832	Hangchow	4	19,430
Red Cross, Shanghai	11	7,987	Lester, Shanghai	16	59,039
Wuhu	-	5,088	Wusueh	-	2,325
Nanking	11	18,634	Teian	-	2,775
Nanchang	-	8,558	Suchowfu	8	14,460
Changsha	1	9,486	Wuhu	3	6,019
Hankow	1	7,360	Nanking	18	19,830
Kweiteh	9	5,996	Nanchang	1	9,779
Hwaiking	6	2,598	Changsha	-	6,131
Tsinan	48	12,804	Methodist, Hankow	-	5,352
			Union, Hankow	-	9,411
			Siangyang	1	3,614
			Luchowfu	-	6,141
			Kweiteh	10	6,333
			Hwaiking	1	2,273
			Tsinan	8	6,687
			Tientsin	8	26,489
			Changte	15	7,254
			Paotingfu	1	6,214
16 Hospitals	127	190,745	25 Hospitals	121	268,684

with other acute infectious fevers in the Survey hospital populations for these two years:-

1933		1934	
Disease	No. of Cases	Disease	No. of Cases
Typhoid	1,516	Typhoid	1,670
Diphtheria	277	Measles	517
Measles	191	Diphtheria	420
Cerebro-spinal Fever	149	Cerebro-spinal Fever	165
Scarlet Fever	142	Scarlet Fever	121

Both measles and diphtheria in each year are numerically more important than scarlet fever, which, assuming that the present hospital populations depict, however crudely, the relative incidence of these diseases in the country, parallels the state of affairs in other parts of the world. This, however, is but an index of morbidity, while there is evidence of its rôle in mortality of quite a different nature. For instance, in the report of the Rural Health Experiment at Ting Hsien, Che'n states: "The chief causes of mortality are tetanus neonatorum, smallpox, scarlet fever and tuberculosis of all forms" (7). In the First Special Health Area, Peiping, Grant and Yuan (8) found that scarlet fever occupied the following position as a cause of death (Table 31).

In this period measles had a death rate of 26, typhoid 20 and diphtheria 11 per 100,000, leaving no doubt as to the importance of scarlet fever as the most deadly of the acute infectious fevers. Nanking in the Yangtze Region has not

experienced/.....

TABLE 31 : CAUSES OF DEATH IN SPECIAL HEALTH AREA, PEIPING (GRANT AND YUAN).

Cause of Death.	Average Death Rate 1926-32 per 100,000 Population.
Tuberculosis of the Respiratory System	303
Respiratory Diseases (other than Tuberculosis)	260
Diseases of the Digestive System not otherwise specified	244
Cardio-renal Diseases	166
Convulsions	125
Senility and Apoplexy	120
Diarrhoea and Enteritis	110
Congenital Debility and Premature Birth	91
Tuberculosis of Other Organs	81
Scarlet Fever	80

experienced such a virulent form of scarlet fever as the report of the Municipal Health Administration (9) places scarlet fever below typhoid and diphtheria both in incidence and virulence.

Seasonal Incidence.

Scarlet fever in European countries is usually considered to attain its peak of prevalence in the autumn months. Table 32 gives the seasonal distribution for the two years of the Survey. The monthly distribution of the two years 1933 and 1934 c ombined is given for each hospital and in Figure 19 a graph of the monthly distribution of all cases is also given. If China is considered as a whole the present study indicates that scarlet fever, far from being an autumnal disease, is most prevalent in the spring months with the largest number in March, and at its lowest in the autumn months of August and September. Though standardised rates and other accurate indices are not available, for the present purpose the comparison of the absolute number of cases of scarlet fever per month with the total hospital admissions per month as given in a previous chapter strengthens the argument that the absolute figures represent a true seasonal distribution. Total hospital admissions are at their peak in summer and lowest in winter, implying that a scarlet fever peak in spring is relatively more significant.

Sex Incidence.

For all patients it will be remembered that the sex ratio was 2.11 males to 1 female. In the case of scarlet fever the ratio is much reduced, being

1.28/.....

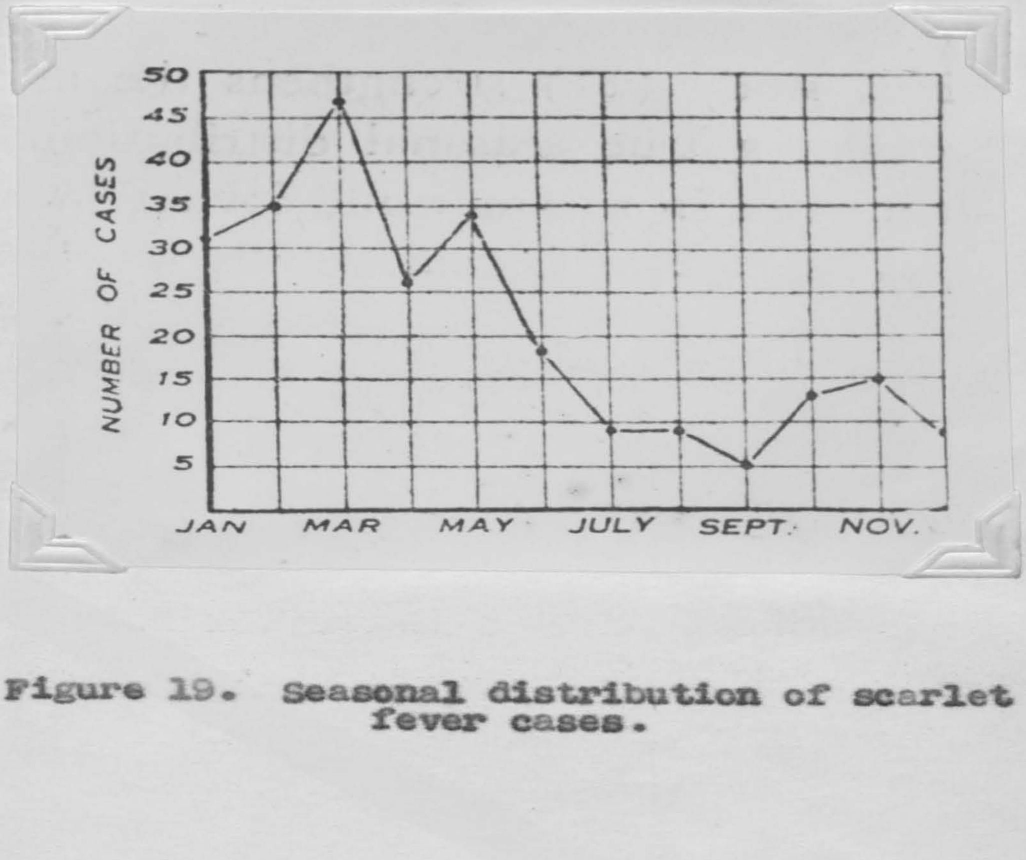

Figure 19. Seasonal distribution of scarlet fever cases.

TABLE 32 : SEASONAL INCIDENCE OF SCARLET FEVER.

Hospital	Months												
	January	February	March	April	May	June	July	August	September	October	November	December	Total
Canton	1	-	-	-	-	-	-	-	1	-	-	-	2
Yunnanfu	6	1	5	1	4	5	-	1	-	5	4	3	35
Foochow	-	-	1	-	-	-	-	-	-	-	-	-	1
Changteh	-	-	-	-	1	-	-	-	-	-	-	-	1
Changsha	-	-	1	-	-	-	-	-	-	-	-	-	1
Nanchang	-	-	-	-	-	1	-	-	-	-	-	-	1
Hankow	-	-	1	-	-	-	-	-	-	-	-	-	1
Nanking	3	2	3	6	2	5	-	1	1	3	2	1	29
Wuhu	-	-	-	-	-	1	1	1	-	-	-	-	3
Hangchow	-	3	9	2	1	-	2	1	1	-	-	-	19
Lester, Shanghai	3	1	4	5	6	1	1	3	-	1	3	1	29
Red Cross, Shanghai	2	3	3	1	2	-	-	-	-	-	-	-	11
Suchowfu	1	1	1	1	1	-	2	-	-	1	-	-	8
Siangyang	-	-	-	-	-	-	-	-	-	-	1	-	1
Kweiteh	4	3	2	-	3	1	2	-	1	1	1	1	19
Hwaiking	1	2	-	1	2	-	-	1	-	-	-	-	7
Tsinan	9	15	13	8	5	1	-	1	-	1	1	2	56
Tientsin	-	-	1	1	2	-	1	-	1	-	2	-	8
Changte	1	4	3	-	4	2	-	-	-	1	-	-	15
Paotingfu	-	-	-	-	1	-	-	-	-	-	-	-	1
TOTAL	31	35	47	26	34	17	9	9	5	13	14	8	248

1.28 males to 1 female. This is largely explained by the different age incidence of scarlet fever as seen in the next section. Scarlet fever in the present hospital population is largely a disease of adolescents, while the numerical disparity between the sexes in the total population results from the large numbers of males in the young adult and middle-age groups; consequently the present analysis does not suggest any major sex difference in the incidence of scarlet fever.

Age Distribution.

The classical outbreak of scarlet fever in the Faroe Islands resulted in the infection being equally heavy upon all age groups up to twenty years of age, with but a slight incidence in the higher ages. Though this experience of scarlet fever in a community which had been free from it for many years suggests that age until about twenty years is not a significant factor in susceptibility, in the usual urban community the acute nature of the condition and the multitudinous avenues of dispersal favour the attack on the child ages.

The cases of the present series have the age distribution given in Table 33 and Figure 20.

This comparison of the percentage age distribution of scarlet fever cases with the percentage age distribution of the total hospital patients is admitted to be an extremely crude index of the true age incidence of the disease. Nevertheless, it does reveal some features which are of interest.

The/.....

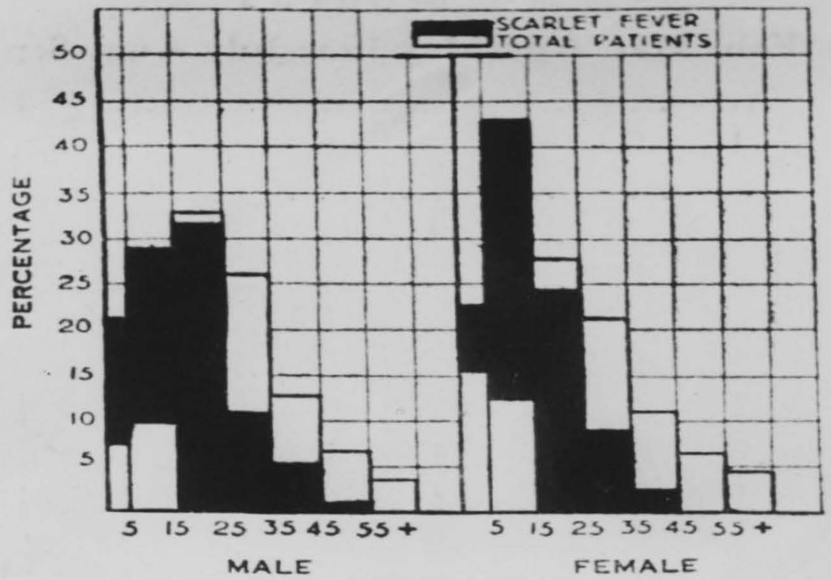

Figure 20. Age distribution of scarlet fever cases, compared with total hospital patients.

TABLE 33 : PERCENTAGE AGE DISTRIBUTION BY SEX OF SCARLET FEVER CASES AND TOTAL HOSPITAL PATIENTS.

Age Group	Scarlet Fever		Total Patients	
	Male	Female	Male	Female
0 -	21.8	23.1	7.5	16.0
5 -	28.1	42.6	9.8	13.2
15 -	32.5	24.1	33.8	27.3
25 -	10.9	8.3	26.1	20.9
35 -	5.1	2.0	13.5	11.4
45 -	1.6	-	6.4	6.9
55 +	-	-	3.0	4.4
	100.0	100.0	100.0	100.0

The peak of the scarlet fever incidence in males is the age group 15-24 years, but in the females an acute apex of the peak is found in the age group 5-14 years. Though it has been previously demonstrated that the age composition of Chinese hospital patients is different in the larger proportions falling in the younger age groups than occurs in European and American general hospital populations, the scarlet fever grouping is rather unexpectedly large in the adolescent ages. As scarlet fever in urban communities elsewhere is a disease of young children, the above adolescent grouping may suggest a different age incidence in China which, however, will require the use of more accurate indices for proof.

Summary.

1. Analysis of the records of the hospital survey for 1933 and 1934 demonstrates that scarlet fever has a wide distribution in China.

2. Relative incidence and severity of the disease increases on proceeding from south to north, with the exception of the mountainous province of Yunnan.

3. The seasonal incidence in the present sample differs from that of Europe and America in that the greatest number of cases occurred in spring.

4. The slightly higher incidence in males cannot be considered significant.

5. The age distribution is of some interest in that the male peak occurred in the age group 15-24

years/.....

years and the female peak in the age group 5-14 years, suggesting that in China scarlet fever is largely a disease of adolescents.

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1. Wong, K. Chimin and Wu Lien-teh. "History of Chinese Medicine." Tientsin Press, 278, 1932.

2. Stanley, A. Report, Shanghai Municipal Council Health Department. 13, 1917.

3. Report. Report, Shanghai Municipal Council Health Department. 16, 1935.

4. Yang Ting-kuang and Shih, W. H. "Scarlet Fever in China." Reports, Manchurian Plague Prevention Service. 4: 207, 1924.

5. Lin, C. S. and Jettmar, H. M. "The Scarlet Fever Problem in Far East." Reports, Manchurian Plague Prevention Service. 5: 148, 1926.

6. Yu, H. and Wei, H. "Studies on Local Strains of Streptococci in Scarlet Fever." Trans. 9th Congress Far East. Assoc. Trop. Med. Nanking. 1: 185, 1934.

7. Che'n, C. C. "Scientific Medicine as Applied in Ting Hsien." Third Annual Report of the Rural Health Experiment in China." Quar. Bull. Milbank Mem. Fund. 11: April 1933. No. 2.

8. Grant, J. B. and Yuan, I. C. "A Note on the Forces of Mortality and their Classification in Peiping." Chinese Med. Jour. 46: 1187, 1932.

9. Report. Annual Report, Nanking Municipal Health Administration. 5, 1933.

CHAPTER XVI.

ANTERIOR POLIOMYELITIS, ENCEPHALITIS EPIDEMICA AND CEREBRO-SPINAL MENINGITIS.

It has been possible in this chapter to make but the briefest notes regarding three of the infective diseases of the nervous system, though syphilis and tuberculosis of this system have received separate consideration in their respective chapters.

Mental and nervous diseases, most authors agree, are as frequently seen in China as in European countries, though there are certain indications that their proportionate distribution differs in some respects. There are other intriguing suggestions that owing to a different philosophical and religious outlook the minor psychoses and the psycho-neuroses take a different form in the Chinese from the European. The major psychoses, dementia praecox and manic-depressive psychoses, however, are much alike whether in Chinese or European. The subject generally of mental disease in the country requires study so that at this stage discussion of the epidemiology of mental diseases is little more than speculative. On the other hand, certain of the infective diseases of the nervous system are better known and for the present discussion the Survey records of cerebro-spinal meningitis, encephalitis epidemica and anterior poliomyelitis have been selected for examination. It is of added interest to group these in a single section owing to their

epidemiological/.....

epidemiological similarities.

Cerebro-spinal Meningitis.

According to the findings of the Central Field Health Station (1) epidemic meningitis is more prevalent in the Yangtze Valley than in other regions, while as an index of its importance as a cause of death it may be noted that in the Peiping Special Health Area it had a death rate of 70 per 100,000 population in the years 1926-1932. Epidemics are reported from time to time, two of the more recent being in Hengchow in 1934 (2) and in Changsha in 1935 (3).

The Survey hospitals reported a wide distribution of cerebro-spinal meningitis for both 1933 and 1934. In 1933 it was recorded by 23 out of the 28 co-operating hospitals and in 1934 by 16 of the 25 hospitals. The 1934 results numbered 170 cases. Epidemic c onditions existed in Swatow in 1933 where 57 cases out of a total number of 10,914 hospital patients were reported, and in Hengchow in 1934 with 48 cases of the infection out of 6,364 hospital patients. The 1934 returns further suggest a geographical difference in that of the total cases, viz: 170, only 4 cases came from the northern group of hospitals. Distribution in 1933 was not so distinctive.

Seasonal/.....

Seasonal distribution was analysed for 1934 with the following results:-

Month	No. of Cases
January	7
February	11
March	30
April	58
May	24
June	9
July	13
August	3
September	3
October	2
November	4
December	6

This monthly incidence is of definite interest, especially if it is remembered that total hospital populations rise to their maximum in July and August. Cerebro-spinal fever then in this instance had its peak in spring which is usually the season when its prevalence has been highest in most countries.

Sex incidence was 100 males to 70 females, a difference which, on the basis of hospital populations in China, cannot be interpreted as having any significance. Age distribution is of some interest. This is given in Table 34. The highest incidence occurred in the age group 5-14 years, and over 60 per cent. of cases were under 25 years of age.

Encephalitis Epidemica.

This disease has received some attention in China and cases are known to have occurred in

most/.....

TABLE 34 : AGE DISTRIBUTION OF CEREBRO-SPINAL MENINGITIS, ENCEPHALITIS EPIDEMICA AND ANTERIOR POLIOMYELITIS.

Disease	Age Groups in Years								Total Cases
	0 -	1 -	5 -	15 -	25 -	35 -	45 -	55 +	
Cerebro-spinal Meningitis	15	30	66	48	8	2	-	1	170
Encephalitis Epidemica	1	1	4	13	19	8	5	1	52
Anterior Poliomyelitis	4	30	14	7	2	-	-	1 age unknown	58

most districts. In 1934 a surprising number of hospitals, viz: 14, noticed the disease. No geographical differences of any moment were displayed, with the exception of Yunnan which reported 29 out of the total of 52 cases seen in this particular year. With such a small number of cases an examination of seasonal distribution was not worth while, but age distribution, as Table 34 indicates, is important in that the peak of incidence occurred in the age group 25-34 years, differing thereby from cerebro-spinal meningitis with cases chiefly in the young age groups.

Anterior Poliomyelitis.

As previously mentioned in Chapter X this disease has received little attention in China. This is scarcely justified as the Survey evidence shows that the disease exists throughout the country. In 1934, 18 of the hospitals reported one or more cases. No geographical nor seasonal distinctions were noted, while age distribution, as was to be expected, gave the largest numbers of cases in the 1-14 years age group.

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1. Report. Report, Central Field Health Station, Nanking. Jan-Feb., 1934.

2. Brown, C. F. and Broady, R. A. "Cerebro-spinal Meningitis." Chinese Med. Jour. 49: 155, 1935.

3. Su, T. F. "Meningococcus Meningitis in Children." Chinese Med. Jour. 50: 491, 1936.

CHAPTER XVII.

MALARIA.

The Survey was not the first occasion on which malaria formed the subject of a collective study in China. In their book on the diseases of China Jeffreys and Maxwell (1) based their discussion on the incidence of malaria on material secured through the Medical Association, and then again in 1926 appeared the report by Faust (2) on behalf of the Research Committee of the Association. This paper, which embodies the analysis of questionnaires sent to hospitals throughout the country, remains still the best source of information on the general distribution of malaria in China. Accordingly its findings are given here for comparative use in discussing the result of the present study. Briefly they are given in the following quotation:-

> "The three types of the disease occur all the way from the southernmost Chinese border to Peking. Aestivo-autumnal malaria has been reported endemically north of a line drawn from Peking to Seoul. The three types also occur from the Szechuan Plain down to the China Sea. Tertian malaria (benign type) has the most extensive distribution, being found in Manchuria where aestivo-autumnal does not occur, and in South Shensi where neither of the other two varieties has been seen endemically. Although quartan malaria has been reported from as

far/.....

far north as Harbin from the Chengtu Plain to the west, its distribution is somewhat more restricted or, more correctly speaking, more "spotty". It is not reported from Seoul or from Hunan Province, in both of which places it was previously found."

In the present chapter the twenty-five hospitals which returned records of all new patients treated both in ward and dispensary throughout 1934 have been considered. Undistinguished by any major catastrophe of flood, famine or civil war, this year may be treated as providing the usual endemic conditions of malaria. Notwithstanding this fact, malaria was one of the major diseases sending patients to scientific hospitals for treatment. From Table 35 it will be observed that every hospital reported malaria. The hospital at Wusueh had the largest proportion of cases, 6.2 per cent. of all patients, while the Lester Hospital at Shanghai and the Mission Hospital, Swatow, with malaria cases forming .4 per cent. returned the least proportion. In the total hospital population malaria formed 1.6 per cent. of all patients, this including both in-patient and out-patient totals. The institutions in Table 35 have been arranged in groups[7] proceeding from South to North China, and from this it is observed that South China and the Yangtze Region institutions are affected to a similar extent by malaria, but that those of North China have a lower incidence. The climatic regional differences make this incidence variation not unexpected.

Incidence of the Various Types.

The unfortunate defect in collective investigation is always in the lack of complete and uniform returns made. In the case of malaria the totals are a valuable index of the importance of this disease in China, but finer analysis in seeking knowledge of the distribution and prevalence of the various types has been hampered by too many hospitals not qualifying the diagnosis of malaria. The results, such as they are, are given in Table 35. A total of 4,222 patients was diagnosed as malaria, but 2,897 cases are not distinguished according to the form the disease took. This means that only 1,325 are capable of being subdivided into 822 cases of benign tertian, 171 quartan, 325 malignant tertian, and only 7 cases of mixed infection. Faust's conclusions of the type distribution are confirmed when Table 35 is examined as all three varieties are found in hospitals from every area of China. Even in the instance of malignant tertian, northern hospitals in Kweiteh, Paotingfu and Tsinan discovered the infection. Again in agreement with Faust is the occurrence of the quartan type as hospitals did not report it so regularly, though, contrary to his findings, a hospital in Hengchow, Hunan Province, reported cases of quartan malaria. Quartan malaria contributed as many cases as the other varieties in such hospitals as Luchowfu, Hankow and Wusueh, an epidemiological fact of no little interest.

TABLE 35 : INCIDENCE OF DIFFERENT FORMS OF MALARIA.

	No. of Cases						Percent. of Total Hospital Cases.
	Tertian	Quartan	Subtertian	Mixed	Unqualified	Total	
Union, Foochow	16	-	19	-	142	177	3.0
Hope, Kulangsu	6	-	25	-	39	70	3.4
Canton, Canton	14	-	9	-	273	296	4.1
Mission, Swatow	9	-	4	1	31	45	.4
C.M.S., Yunnan	205	3	42	-	108	358	2.5
Christian, Luchowfu	34	30	21	-	187	272	4.4
General, Wuhu	60	7	4	-	100	171	2.8
Kwangchi, Hangchow	29	3	17	3	662	714	3.5
Presbyterian, Hengchow	14	3	7	-	75	99	1.6
Methodist, Hankow	51	20	23	1	30	125	2.3
Union, Hankow	12	2	31	-	133	178	1.9
Bethesda, Siangyang	3	-	-	-	48	51	1.4
Methodist, Teian	4	5	2	-	123	134	4.8
Methodist, Wusueh	73	69	1	-	3	146	6.2
General, Nanchang	43	7	53	1	224	328	3.4
University, Nanking	112	6	21	-	186	325	1.6
Lester, Shanghai	80	12	40	1	97	230	.4
Christian, Suchowfu	-	-	2	-	98	100	.7
Hudson T., Changsha	-	-	-	-	22	22	.4
General, Changte	-	-	-	-	67	67	. .9
Menzies, Hwaiking	12	3	-	-	4	19	.8
St. Paul's, Kweiteh	1	-	2	-	60	63	1.0
Taylor, Paotingfu	24	1	1	-	69	95	1.5
Mackenzie, Tientsin	3	-	-	-	85	88	3.3
Cheeloo, Tsinan	17	-	1	-	31	49	.7
TOTAL	822	171	325	7	2,897	4,222	1.6

TABLE 36 : SEASONAL INCIDENCE OF MALARIAL TYPES.

Month	Type of Malaria			
	Total Malaria Cases	Benign Tertian	Quartan	Malignant Tertian
January	115	16	9	8
February	91	12	5	4
March	181	29	21	9
April	183	46	11	4
May	316	69	17	9
June	497	133	5	21
July	667	163	12	41
August	531	125	15	53
September	471	92	16	35
October	552	83	27	56
November	434	45	23	59
December	184	9	10	26
TOTAL	4,222	822	171	325

Seasonal Incidence.

The monthly reporting made during 1934 is given in Table 36. As the seasonal incidence by hospitals would have resulted in such small numbers per month for each institution as to be of no great value, all institutions have been combined.

The results are to be taken therefore as an indication of the seasonal incidence of malaria in China as a whole. Malarial patients apply throughout the year for treatment, with greatest numbers, as is to be expected, at the height of summer, June to September, and the least in the coldest months of January and February.

Considered separately one or two points of difference may be noted in the seasonal occurrence of the types of malaria. The greatest number of benign tertian patients applied for treatment in July, the greatest number of quartan cases in October and November, but curiously malignant tertian occurred in greatest numbers in November. Though the numbers of cases are relatively small it remains interesting that the present series differ from the usual seasonal feature of the three types in that the quartan peak precedes that of the malignant tertian (Figure 21).

Age and Sex Incidence.

The total hospital population for 1934 had a sex ratio of 219 males to 100 females (Chapter VIII). In Table 37 it will be seen that benign tertian malaria for the same year attacked 626 males and 196 females/.....

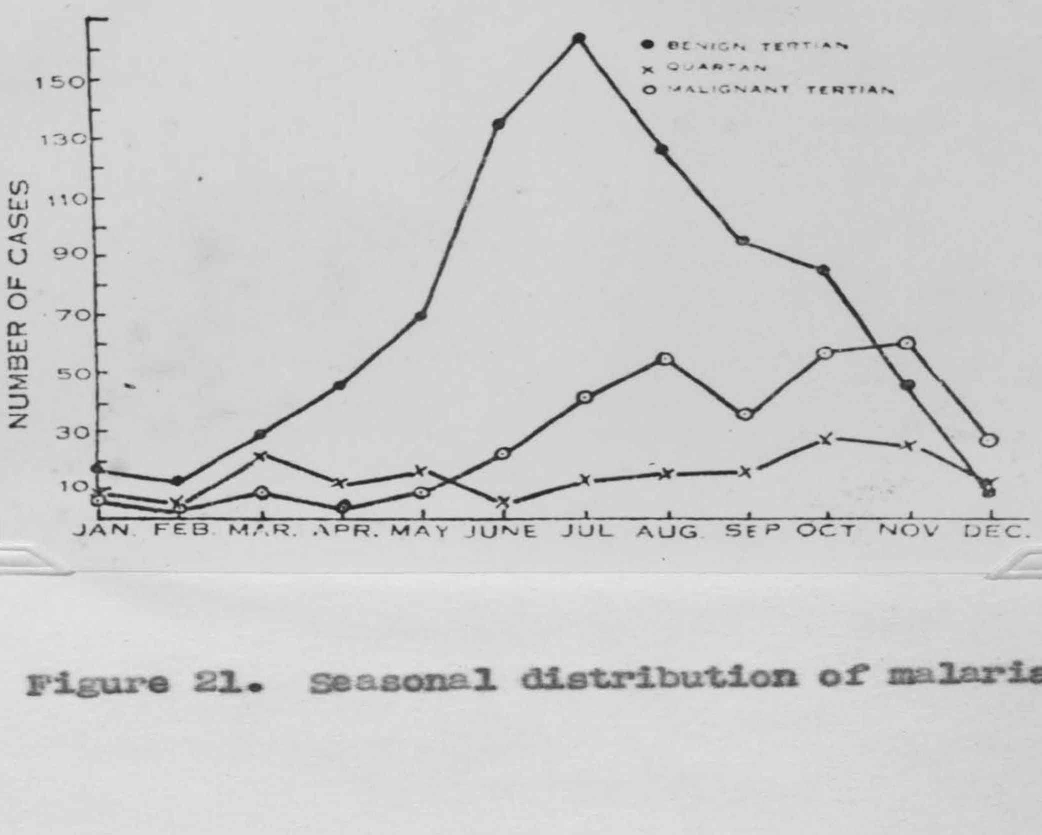

Figure 21. Seasonal distribution of malaria.

TABLE 37 : AGE AND SEX INCIDENCE OF BENIGN TERTIAN AND MALIGNANT TERTIAN.

Age Groups	Benign Tertian			Malignant Tertian		
	M.	F.	P.	M.	F.	P.
0 -	6	4	10	-	-	-
1 -	21	15	36	4	2	6
5 -	53	37	90	15	7	22
15 -	273	66	339	102	13	115
25 -	182	37	219	114	9	123
35 -	67	16	83	43	-	43
45 -	17	13	30	7	5	12
55 +	6	7	13	2	1	3
Unknown	1	1	2	1	-	1
TOTAL	626	196	822	288	37	325

females, while malignant tertian affected 288 males and 37 females. The ratio of malarial male to female patients is thus considerably higher than the general hospital population male-female ratio.

In the examination of the age constitution in Chapter VIII it was shown that the largest proportion of hospital patients falls into the age group 15-34 years. The group actually included 48.2 per cent. of all patients.

Benign tertian malarial patients have a different age grouping from that of the general hospital population. Again the largest age group is that of 15-34 years, but it contains an even higher percentage as 67.8 per cent. of malaria cases are grouped in it. Over 73.2 per cent. of the malignant malarial patients are grouped in the same age period, 15-34 years.

As far as hospital patients therefore are concerned, benign and malignant tertian varieties of malaria have their relative and absolute highest incidence in males and in the age group 15-34 years.

<u>Summary</u>.

1. In the total hospital populations both ward and dispensary, seen in twenty-five hospitals throughout China during 1934, malaria was one of the major causes of morbidity, forming 1.6 per cent. of all patients.

2. South China and the Yangtze Region, as was to be expected, had a higher incidence than North China.

3. Benign tertian malaria was the most frequent type seen and malignant tertian was more numerous than quartan.

4. All types occurred throughout China with quartan cases being distributed more patchily than the other two forms.

5. Seasonal incidence revealed that benign tertian had its peak in July, quartan in October, and malignant in November.

6. Sex and age incidence revealed that males and the age group 15-34 years were overwhelmingly affected.

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1. Maxwell, James L. "The Diseases of China." 2nd Edition, Shanghai. 1929.

2. Faust, E. C. "An Inquiry into the Prevalence of Malaria in China." Chinese Med. Jour. 40: 937, 1926.

CHAPTER XVIII.

SOME HELMINTHOLOGICAL CONDITIONS.

It is well known that China is a happy hunting ground for helminthologists. The number of intestinal worms is legion and their life histories, where known, display some extraordinary relationships to the diet of man. It is the various dietetic customs and certain practices of using night-soil as fertiliser which have exposed the Chinese to such varieties and numbers of these parasites.

The works on helminths are innumerable and the subject is so vast that but a few brief notes on certain selected conditions are possible in the present chapter.

The type of knowledge and opinion held by ancient Chinese medicine concerning helminths is given by Chu and Chiang in translations of twelve old writings (1). These twelve works extend over a period from Tsang Kung Lieh Chuan, 180 B.C. to Pien Chiao Hsin Shu in 1767 A.D., and as Hoeppli in an introduction to the study points out, there are several remarkable similarities in the different texts. "This similarity doubtless derives from the fact that later authors accepted as truth the opinion of former authors without checking it by their own observations."

It is of unusual interest to note the theories held by these authors as to the origin of the worms which, with slight variation, persist through the twelve works, and are sufficiently

illustrated/.....

illustrated in this extract from the translation given of the Ch'ao Shih Ping Yuan of 605 A.D.

> "The 'Ts'un Pai Ch'Ung' is also one of the nine worms. It is about one inch long, white in colour and flat in shape. The attack is due to the weakness of one's viscera. It is said that the infection is due to drinking of 'white' wine and eating of raw beef and raw grains. It is also said that eating of raw fish followed by a drink of cold milk likewise produces the infection. It weakens one's general physical condition and produces pain and weakness of the kidney and feet. If the worm grows to one foot in length it causes the death of the host."

Hoeppli says:- "It is very remarkable, however, that several times the 'Ts'Un Pai Ch'Ung' which, in our opinion, is a tapeworm, is said to be produced by eating raw meat, a belief which is quite evidently not purely speculative but rather the result of observation." Besides the tapeworm the authors consider that they have identified Oxyuris vermicularis and Ascaris lumbricoides in these early writings.

Many investigators have put on record estimates of the intensity of infestation in various Chinese population groups. These records are in the process of summary by Hsu (2), while further work into various helminthological problems is being pursued by the Central Field Station at Nanking (3). Winfield (4) in his review of

faecal-borne/.....

faecal-borne diseases gives interesting comparative data which emphasise the importance of helminths in human disease in China. He divides them into two broad epidemiological groups. In the first group are the important parasites causing schistosomiasis, ancylostomiasis, fasciolopsiasis and clonorchiasis. Their distribution is patchy. The second group includes ascariasis which is of universal distribution and results in an extraordinarily high degree of infection in every community.

As the Survey patients are considered on a basis of routine examination and treatment, no estimate has been possible of the proportion of them infected with helminths. In both 1933 and 1934 these parasites were included in the disease list in two groups - (a) Schistosomiasis, (b) Other helminthic infections. On this classification the following cases were returned whose chief complaint on diagnosis was attributable to helminths:-

Year	Schistosomiasis	Other Helminths	Total Hospital Patients
1933	94	4,372	208,045
1934	205	3,881	268,684

Generally then helminths were an aetiological agent of some significance in the Survey hospital patients. In order to extract further information from this data the group "Other helminthic conditions" was further sorted and the major

features/.....

features of interest are given in the following notes, though <u>ascariasis</u> and <u>ancylostomiasis</u> have been omitted.

<u>Clonorchis sinensis</u>.- This fluke infection, contracted by the consumption of raw fish, has been found to occur naturally in China in cats, dogs, wild cats, martens and badgers (Faust and Khaw) (5). The disease in cats and dogs occurs throughout the country with the exception of the north-west provinces. Experimentally, the majority of mammals are easily infected and Faust and Khaw have shown "that practically every fresh water fish in China is capable of serving as second intermediate host".

Human infection is particularly common in South China where the habit of eating raw fish is usual. The heaviest endemic areas are those around Canton and Swatow, but cases are reported from hospitals in other provinces, chiefly of individuals who have contracted the condition in Kwangtung. For example, in the hospital survey, reports of cases came from Canton, Swatow, Hongkong, Nanking, Peiping and Shanghai.

<u>Fasciolopsis buski</u>.- It is well known that pigs are infected with this fluke in Central and South China, while Faust has demonstrated a further reservoir host in South China in the dog (6). The encysted cercariae are to be found on the water-chestnut and the water-caltrop, two plants favoured by the snail intermediate host. The human population eats these plants in the raw state with the result that in some areas

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an appallingly high incidence of the disease can be revealed, as for example shown by Barlow in Chekiang Province (7). This province and Kwangtung show the highest degree of incidence, but infection occurs in many other areas as Shanghai, Nanking, Nanchang, Changsha amongst the Survey hospitals reported instances in 1933.

Paragonimus.- Pigs, dogs, cats and other carnivorous animals are subject to infection with this lung fluke. Cases occur in human beings in China, the first being that reported by Manson of a Chinese he treated in Amoy. Examination of the sputum revealed ova which Manson noted were similar to those from Ringer's Formosan case (8). The majority of human cases have been reported from Fukien Province, leading to the belief that their source is mainly Formosan. However, Ying (9) in 1930 and Maxwell (10) in 1931, reported the infection of individuals who had never been out of Shaohsing district. A further focus of infection is suggested in a note by Maxwell (10) of Watson's reported indigenous case from Yunnan. In the hospital survey records there is a second case reported by Watson from Yunnan in 1933. Therefore, though the infection has been found in the first intermediate host (Melania) in China by Faust (6) and the Chinese commonly eat pickled fresh water crabs and shrimps, human cases are not commonly seen.

Schistosomiasis.- This disease due to S. japonicum is most commonly found in the Yangtze River basin, though cases have been reported from the province of Kwangtung. The delta regions of the Yangtze are regions of greatest prevalence, Chekiang Province, for instance, being severely affected. The Survey hospitals but confirmed previous knowledge as only those in the Yangtze River basin reported cases. These hospitals, however, stretching from the mouth to the upper river, give an index of the length of country involved.

Taenia. - T. echinococcus (Hydatid).- The host of the adult worm of most concern to man is the dog, though other domestic animals are by no means unimportant.

As has been stressed by Loucks (11), the conditions existing in Mongolia and North West China, where hordes of scavenging dogs live in association with flocks of sheep, provide the ideal environment for the propagation of the disease. The incidence of the larval form, the hydatid cyst, in animals in China does not seem to be noted in the literature so that presentation of the following figures from the Shanghai Municipal Council records may be interesting:-

Animals Examined	Number
Pigs	1,182,382
Oxen	89,483
Calves	29,185
Sheep	113,649
Buffaloes	1,189
Horses	87

In this series of animals hydatid cyst was discovered in 350 cases, but its distribution

amongst/.....

amongst these animals is not indicated in the records.

Human infections in China are fully reviewed by Loucks (11). He gives two tables of cases recorded in China, the first being the series reported previous to his own investigation and the second those he saw in Peiping. The distribution of these cases is wide, including the provinces of Shantung, Szechuen, Fukien, Hopei, Kiangsu, Kansu, Charhar and Mongolia, but of the total number of 31 cases only 4 occurred in the south or central provinces.

T. saginata.- Mills (12) reviewed the available evidence of this condition as seen in Peiping and reported the first instance of Cysticercus bovis in butcher's meat in that city. North China and the adjacent territories of Manchuria and Mongolia are cattle countries with meat figuring in the diet of the people, and consequently cases of the infection are to be found particularly in this part of China. In the Shanghai municipal inspections in the series of cattle given above no case of Cysticercus bovis is reported and in the Hongkong Sanitary Department reports which deal with approximately forty to fifty thousand cattle yearly, the condition is not mentioned.

This tapeworm was reported in a further 9 cases from Peiping in the Survey, but no other area specifically diagnosed the condition, although 11 cases were returned as taeniasis from centres such as Shanghai, Hongkong, Canton, Tsinan,

Nanchang/....

Nanchang and Tientsin.

T. solium.- Pork is the meat favoured by the Chinese throughout the country and yet infection with Taenia solium is extremely rare. The explanation is to be found in the fact that it is eaten in a well-cooked condition. Meat inspection in Shanghai of over one million pigs did not reveal a single specimen of Cysticercus cellulosae, and in Hongkong from 1910 to 1933 (reports of 1921, 1922, 1923 not seen) where an examination of over two hundred thousand pigs has been made annually, only 2 cases are reported, both in 1928 (13).

Mills (14) refers to a case of C. cellulosae from Chefoo and reports a further instance in pork in Peiping.

Cases of human infection are also referred to by Mills as having occurred in Tsingtao amongst Europeans and in Chinese in Wei-hai-wei, Soochow, Hankow and Peiping. Only 2 cases were specifically diagnosed in the hospital survey, one from Peiping and one from Nanking, both in Chinese subjects.

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CHAPTER XIX.

SOME DISEASES COMMON TO MAN AND ANIMALS.

The part played by animals in the domestic economy of the Chinese is well illustrated by the following extracts from Cressey's recent book (1):-

> "Agricultural China teems with active people. The landscape everywhere has a utilitarian aspect and betrays the lavish care bestowed upon the production of food. Cultivated land is almost universally devoted to crops grown for direct human utilisation. In the absence of animal husbandry, there are no pasture lands or hayfields.
>
> The contest for subsistence has thus crowded out all but draft animals and types such as pigs and chickens which forage for themselves. Meat other than fish plays a small part in Chinese diet. More people can be supported in a given area if the food is used directly for human consumption instead of first being fed to animals. Dairy or beef cattle are rarely raised by the Chinese, except where produced for foreign consumption. The Mohammedans, however, eat beef and mutton in place of pork, and their butcher shops are to be found in all larger cities. Pigs and chickens are raised on most farms

throughout/.....

throughout the country, with increasing numbers in the south. Most of the larger livestock are kept for work around the farm or for occasional transportation needs. Studies by Buck indicate that oxen are found on 52 per cent. of the farms in the north and 31 per cent. in the east central area. Water buffalo are absent in the north but are present on 40 per cent. of all farms in east central China. Donkeys and mules are owned on 54 and 14 per cent. respectively of northern farms as compared with 7 and 0.4 per cent. in the more southerly areas."

It has been estimated by Buck (2) in his study of rural families that while 89.8 per cent. of the food energy is provided by seeds and their products, animal products provide only 1 per cent. and that these comprise pork, eggs, fish, chicken and mutton in that order of importance. Milk of the cow, buffalo, or goat is used to a very small extent in the rural districts of China proper, but in the ports and foreign settlements dairy products are being adopted to an increasing degree by the populations.

That animal products interested the practitioners and herbalists of the old Chinese medicine to a considerable degree is evident; in fact it has been declared that no single constituent, pleasant or unpleasant, of the three animal kingdoms is missing from the ancient pharmacopoeia. Read (3)(4)(5) in his studies of the drugs of classical

Chinese medicine gives details of the various animal constituents used with their reputed pharmacological action, which the following three examples from his works will illustrate:-

"Cow's Milk. - Sweet, slightly cooling non-poisonous. Milk from black animals is better than that from white ones. It should be boiled twice and then cooled before taking. It is incompatible with acids. Taken with acids it is constipating and causes cold diseases. Eaten with raw fish it produces asthma."

"Mutton. - Bitter-sweet, very heating, non-poisonous. It is refrigerant in Hindu medicine. Eaten during convalescence after fevers, epidemics or malaria it will cause a dangerous relapse of the sickness. Eaten by pregnant women the child when born will have fever. Animals with only one horn, or a black body with a white head, or the reverse, are poisonous causing carbuncles......"

"Fowls. - Preparations to be avoided. Fowls with variegated plumage (5 colours). Black birds with white heads, or with 6 toes or 4 claws only. Dead animals having extended feet. Castrated animals which crow are poisonous. In May the sitting hens if eaten will cause boils and piles, and weaken both sexes. Children below four years of age who eat any kind of chicken will develop worms......"

The Chinese method of food preparation has an important bearing on disease propagation as most articles are well cooked and the boiling, stewing or frying being performed not on large joints but on small pieces, results in thorough heat penetration, and consequent killing of any parasitic forms present. Even water and milk are taken only after boiling and in a warm state.

Although animal products are relatively unimportant in the diet of the Chinese people, the numbers of domestic animals are far from inconsiderable. The pig, for instance, exists everywhere and is a most important possession of rural families. Horses, mules and donkeys predominate in the northern and north-western provinces, and camels are to be found also in these regions where they are raised primarily as beasts of burden, and also for the wool they provide.

China does a considerable trade in animal products (6)(7). Live animals are sent to such areas as the Philippines, pigs bulking largest. Other items are bone products, wool, skins, bristles, hides and furs. Wool of the sheep, camel and goat is one of the most important pastoral products and is exported mainly to Great Britain, Japan and the United States. Its principal use in China is in the manufacture of rugs. China is one of the chief suppliers of bristles to the world markets, but unfortunately in the past her article has had the reputation of not receiving sanitary treatment and has been subject

to/.....

to the suspicion of carrying anthrax. Hides from both cattle and water buffaloes, skins from the cat, dog, goat and sheep contribute largely to export trade, while furs from Mongolia, Manchuria and Shansi figure, though to a declining extent, in the traffic of the port of Tientsin.

Though her modern veterinary organisation may be in its infancy, China can point to her history in proof of her early concern with animal diseases. In Wong and Wu's "History of Chinese Medicine" (8), it is stated that among the legendary doctors of the period of Huang Ti, the Yellow Emperor, who lives 2698-2598 B.C. "was also a veterinary surgeon named Ma Shih-Huang, who was an expert in treating horses. One day a dragon with drooping ears and gaping mouth came to him for treatment. He punctured his lip and mouth and administered a decoction of liquorice. The dragon was cured. Thereafter many dragons came to him for medicine, and one day they carried him away no one knows where."

The same authors point out that in the Chou Dynasty medical organisation attained a high degree of development. "The Chou Rituals distinguished four kinds of doctors, namely, physicians, surgeons, dietitians and veterinary surgeons ..... Veterinary surgeons treat the ailments and wounds of animals. When any deaths happen the number should be recorded so that they may be replaced." The veterinary department consisted of four lower grade doctors.

China/.....

China with her enormous problems and difficulties can move but slowly in introducing the machinery of modern government. As yet more urgent health and social problems have prevented a government move towards introducing a general veterinary service, but the foreign communities, settled mainly in the ports, with a diet dependent upon animal products, early took means to safeguard such sources of food. Tientsin, Tsingtao, Hongkong and Shanghai as organised settlements particularly undertook meat inspection and dairy control which, in spite of difficulties and setbacks, is gradually reaching a high degree of efficiency, culminating for instance in Shanghai in the recent opening of the new abattoir of the Shanghai Municipal Council.

Apart from the efforts of the foreign communities resident in China, the majority of the large cities have now some method of meat inspection. This service is either directly under the Municipal Bureau of Public Health, or, in the case of small towns, under the Division of Public Health attached to the Bureau of Public Safety. However, only in large and important cities such as Nanking, Peiping, Shanghai, Hankow, Tientsin, Tsingtao and Canton is the inspection performed by competent veterinarians.

In the present chapter there is given a review of some conditions in China which are of interest to both medical and veterinary practitioners.

Actinomycosis/.....

Actinomycosis.

In Animals - The following table gives the numbers of the various animals examined by the Veterinary Department of the Shanghai Municipal Council during the selected period indicated in each which, in most cases, extended from the beginning of 1932 to 30th June, 1934.

Animal.	Period.	Number Examined.
Pigs	2 years 2 months	1,182,382
Oxen	2 years 6 months	89,483
Calves	2 years 6 months	29,185
Sheep	2 years 6 months	113,649
Buffaloes	1 year 6 months	1,189
Horses	1 year 6 months	87

In this group of animals actinomycosis was discovered in only six cases, i.e. four oxen and two pigs, and even in these the disease was purely a matter of minor local infection, involving the head and tongue in the oxen and the mammary glands in old sows.

In Man - Very few cases appear in the medical literature of China. In 1904 a case was reported from Ichang (9) of an adult male who, having been injured by a knife, was treated by a native doctor who rubbed musk into the wound. Microscopical sections taken of the tumour which developed in this site were reported as actinomycosis.

The two cases of lung infection reported by Woo and Yang (10) at Soochow showed no apparent relationship to animal infections. In the Survey records of 248,722 patients received during 1933

only/.....

only two cases of actinomycosis appeared, one from Changteh and the other a Russian woman treated in Peiping. This Peiping case is included in a recent report by Ch'in (11) who gives a total of ten cases reported in the medical literature of China and points out that the geographical distribution extends from Kotong in the southern tropical zone to Harbin in the southern arctic zone.

Anthrax.

In Animals - In Hongkong the animals inspected in the Government stations from 1910-1933 varied from 31,374 to 64,065 cattle, 194,134 to 345,522 pigs and 24,779 to 45,295 sheep a year (12). During this period 69 cases of anthrax were discovered, chiefly in imported cattle from the mainland.

Anthrax is found amongst both dairy and slaughter-house animals in Shanghai. Amongst the inspections by the Shanghai Municipal Council Veterinary Division noted in the discussion of actinomycosis above, 24 cases in 1932, 25 in 1933 and 9 during the first six months of 1934 were discovered. Their distribution was as follows:-

Year	Dairy Cattle	Oxen	Calves	Sheep	Total
1932	5	10	6	3	24
1933	13	4	1	7	25
1934	5	1	1	2	9
Total	23	15	8	12	58

In no case has the disease reached epidemic proportions, but amongst dairy herds where several

cases/.....

cases have occurred, precautionary measures in the form of simultaneous vaccination have been employed with great success. The diagnosis in these cases was made by microscopical examination and confirmed by culture.

Anthrax in animals has been reported from many other areas throughout China, including Yunnan and Szechuen (13)(14).

In Man - Amongst the earliest references to anthrax in man are those appearing in the Customs medical reports. Dr. Begg, reporting on the health of Hankow in 1885 (15) mentions locating a case which had contracted the disease in one of the hide curing establishments then being opened in the Concession. Other Customs medical officers reported the disease from Chinkiang and Wuchow (16). Hankow, Tientsin and Newchwang being concerned so largely in the export of skins are most frequently the source of anthrax reports. Newchwang is notorious. Phillips (17) in sixteen months treated eighteen cases of malignant pustule there, and from this centre bristles, horsehair and hides collected in Manchuria are exported to Europe and the United States. Such materials carry the disease further afield as outbreaks have occurred in England and elsewhere alleged to be due to shaving brushes manufactured from Manchurian horsehair (13)(14) (18).

It is remarkable, on the other hand, that even in areas trading in hides and skins more cases are not seen in the hospitals. Canright (19) reports that in Chengtu, a city in which anthrax-infected

skins/.....

skins and hides must be numerous, he treated only three cases in six years, explaining that, owing to lack of systemic symptoms, patients did not come to foreign hospitals and that the more ignorant went to the native medical man for treatment.

Since 1920 human anthrax has been reported in eight of the annual reports of the Commissioner of Public Health of the Shanghai Municipal Council. The cases numbered seventeen, of which five were traced to either shaving or tooth brushes. In the Survey twenty-two cases of anthrax were reported during 1933. Their distribution was as follows:-

Centre	Males	Females
Hangchow	1	-
Hankow	3	2
Hwaiking	2	-
Peiping	1	-
Shanghai	-	2
Suchowfu	2	-
Tientsin	5	1
Yunnanfu	1	2

Rabies.

Rabies in dogs was known to the old Chinese physicians as far back as the Chou Dynasty and is quoted in the Tso Chuan (20). The official codex of medical jurisprudence for Old China, the Hsi Yuan Lu, dating from about 1240 A.D. recognised rabies in the human and because of its interest the particular passage from Giles' translation is given here (21):-

"Where/.....

> "Where a man has been bitten by a mad dog and died in consequence, there will be a mark of a wound, and the belly will have swollen up hard. The appearance of the victim in the first stages will be that of a man with a violent cold, terribly afraid of wind, barking every now and then like a dog, wanting to bite people and tear their clothes, the belly pendulous and micturition difficult."

Examples of the curious remedies combined, however, with rational wound treatment, are given by Reid in the Customs medical reports (22), such as the application to the bite of a walnut filled with human faeces, or the taking of an infusion of rush pith and black peas accompanied by a local application of pangolin scales, cantharides and artemisia. Concerning these methods Reid says:-

> "In the foregoing extracts from Chinese medical works, the necessity of immediately destroying the poison left in the wound by the bite of a rabid dog is carefully inculcated. The method by the moxa is effectual, although unnecessary and filthy adjuncts are combined with it. Among the external remedies it is curious to note the reliance placed on large doses of cantharides. The same drug was at one time credited in European medicine with certain virtues in the treatment of hydrophobia."

<u>In Animals</u> - Dogs are everywhere in China. Every household has its "wonks", undisciplined, filthy, diseased animals justifying their existence only by their rôle of scavengers. Such uncontrolled animals are well suited to the transmission of any disease and it is little surprising that rabies is the dread disease it is in most parts of China.

In Hongkong the Sanitary Department reported that an outbreak of rabies occurred in 1914 following an absence of several years (12). The disease broke out again in 1919 and every year since then numbers of suspect dogs have revealed positive brain infections.

The Shanghai Municipal Council wages a vigorous war against stray dogs and its recent examinations of suspected rabid animals were as follows:-

Year	Animals Received for Observation				Rabid	
	Dogs	Cats	Monkeys	Mares	Dogs	Cats
1932	241	2	5	-	17	-
1933	279	10	1	-	6	1
1934 (Six months)	125	5	2	1	2	-
Total	645	17	8	1	25	1

During 1933 one pig brought in from outside the Settlement was found to be rabid by microscopical examination. Apart from these animals seen by the Veterinary Division, specimens are also received for laboratory examination and during the same period the following positive cases were revealed:-

1932	54 cases.
1933	50 cases.
1934 (End of June)	21 cases.

In/.....

<u>In Man</u> - Human cases are frequently reported throughout the country and accounts are periodically given in the lay press of spectacular dashes by air either to bring patients to anti-rabic treatment centres such as Shanghai, Hongkong, Nanking and Peiping, or to take vaccine to outlying hospitals. Hongkong records (12) indicate that every year from a score to over a hundred persons receive anti-rabic treatment, and frank cases are seen regularly as, for instance in 1928 when there were seven cases and in 1930, six cases.

From 1900 to 1933 the number of individuals receiving Pasteur treatment annually in Shanghai rose from 10 to 397, this latter group including 138 Europeans. Numbers of the suspected animals were subsequently shown to be non-rabid, and this was the case in 233 of the instances reported in 1933. In this year there were three deaths due to rabies including a Sikh police constable who had received the causative bite 365 days previously. This is the second longest incubation in the history of the Health Department, the longest being that of a woman in 1914 who died 484 days after being bitten (23).

The Survey revealed 30 cases of rabies. The distribution was as follows:- Korea, Peiping, Tsinan, Suchowfu, Hengchow, Changsha, Nanking, Shanghai and Hangchow.

<u>Undulant Fever and Contagious Abortion</u>.

<u>In Animals</u> - In the reports of the Sanitary Department of Hongkong (12) reference is made to the regular supply of vaccine to local dairies and the/...

the occasional discovery of cases of contagious abortion. The Shanghai Municipal Council Veterinary Division, on the other hand, has not yet found any cases in the dairies licensed by it, and the only dairy licensed to sell goat's milk similarly has been free from infection, although it is known to occur in Shanghai cattle (24). Other evidence of animal infection with Brucella in China is given by the Editor of the Chinese Medical Journal (25) who, in 1928, was presented with the following results of agglutination tests carried out by Gibbs in Nanking:-

Foreign imported cattle	29.6 per cent. infected.
Chinese yellow cows	9.0 per cent. infected.
Water-buffaloes	4.7 per cent. infected.

"Sufficient evidence seems to be forthcoming to state that Bacillus abortis is met with in China."

In Man - The presence of undulant fever was suspected by Boone (26) at the beginning of the century, and in 1905 he described cases of Malta fever seen in Shanghai and mentions that he had also seen it in the Chinese. The following year three cases, one a Chinese, were reported from Chungking (27). In the laboratory of the Shanghai Municipal Council (28) positive agglutinations by B. melitensis and B. abortis have been reported in recent years, while Zia and Wang (29) in Peiping in testing sera of undiagnosed fever patients had three positive results. The Survey had further records of undulant fever from Peiping in 1933 and it is to be expected that with the increasing use

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of laboratory diagnoses of undiagnosed fever cases the disease will be found in several parts of China.

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CHAPTER XX.

TUMOURS, BENIGN AND MALIGNANT.

The necessary simple nature of the Survey and the fact that most hospitals in China are limited by situation, lack of staff and special facilities from making elaborate clinical and laboratory investigations, prevented, in most cases, any but the simplest diagnoses being given. For these reasons it has not been possible to undertake any detailed analysis of tumours giving the histological picture or fine pathological subdivisions. It may be taken for granted that with a few exceptions most of the hospitals based their diagnoses on clinical findings alone.

The ancient Chinese medicine concerns itself chiefly with herbal and drug treatments. Surgery is restricted to such simple procedures as needling of tumours and abscesses, the setting of fractures, and dental extractions, as anatomical dissections or major surgical operations are largely incompatible with Chinese philosophical beliefs and are also outside the skill of the Chinese style practitioner. Consequently, Western medical practitioners from the earliest days have been amazed by the variety and grotesque nature of tumours in China, where many reach a size rarely met with elsewhere and the unlimited growth gives rise to peculiar massive degenerations.

In those centres where hospitals have been established, the superior claim of scientific medicine in certain fields has quickly been

appreciated/.....

appreciated by the Chinese. Naturally one of its most striking successes has been in just that province, surgery, which was neglected by the Chinese medicine. Nevertheless, the Chinese horror of interfering with the body limits still the surgical measures he will tolerate. Losing a limb or any part of his body is irreconcilable with his views of a future existence and amputations, when allowed, are conditioned usually by the patient's request for the return of the limb.

In the case of tumours the Chinese is not worried by questions of disfigurement or aesthetic appearance, but in the majority of instances only when pain, severe discomfort or incapacity develops, does he appeal to the Western surgeon for the relief he cannot get elsewhere. This state of affairs must be borne in mind in considering the relative importance of the different diseases seen in hospitals as most probably certain types of tumours have a higher incidence in hospital populations than would be discovered in a true cross-section of the disease population as a whole.

Table 38 shows that in 1933 of the 248,722 records of new patients seen in twenty-seven hospitals situated in twelve of the fifteen provinces of China proper, and one hospital in Korea, 4,851 or 1.95 per cent. were diagnosed as tumours. The group of seventeen hospitals returning complete records of all patients throughout one year gives a satisfactory sample of the disease conditions seen by scientific medicine in China to-day, and as 1.77 per cent. of patients

in/.....

TABLE 38 : TOTAL PATIENTS, OUT-PATIENTS AND IN-PATIENTS, AND TOTAL TUMOURS FOR 1933.

A. Hospitals giving complete records.

Hospital	Town	Total patients	Total Tumours	Percentage of Tumours
1. Severance Union	Seoul	17,300	323	1.87
2. Cheeloo University	Tsinan	12,804	321	2.51
3. Menzies Memorial	Hwaiking	2,598	141	5.43
4. St. Paul's	Kweiteh	5,996	204	3.40
5. University	Nanking	18,634	218	1.17
6. Red Cross	Shanghai	7,987	77	.96
7. Lester Chinese	Shanghai	44,832	497	1.11
8. General	Nanchang	8,558	119	1.39
9. General	Wuhu	5,088	157	3.08
10. Kwangchi	Hangchow	18,767	377	2.00
11. Union	Hankow	7,360	166	2.26
12. General	Changteh	5,375	102	1.90
13. Hudson Taylor	Changsha	9,486	121	1.28
14. Presbyterian	Hengchow	7,668	120	1.56
15. Mission	Swatow	10,914	372	3.41
16. Canton	Canton	9,379	258	2.75
17. C.M.S.	Yunnanfu	15,299	115	.75
Total		208,045	3,688	1.77

B. Hospitals giving partial records.

Hospital	Town	Total patients	Total Tumours	Percentage of Tumours
1. P.U.M.C.	Peiping	5,523	556	10.07
2. Mackenzie Memorial	Tientsin	1,641	64	3.90
3. General	Changte	1,725	60	3.48
4. Christian	Suchowfu	8,839	164	1.86
5. Bethesda	Siangyang	1,631	17	1.04
6. Methodist	Teian	645	10	1.55
7. Methodist	Hankow	5,532	66	1.19
8. Hunan-Yale	Changsha	7,263	117	1.61
9. Methodist	Wusueh	1,705	35	2.05
10. Hope and Wilhelmina	Kulangsu	2,320	42	1.81
11. Government	Hongkong	3,833	32	.83
Total		40,677	1,163	2.86

C. Total Hospitals

		Total patients	Total Tumours	Percentage of Tumours
Total Hospitals		248,722	4,851	1.95

in this group suffered from tumours, this figure may be taken as representative of the importance of tumours in the disease population reached by scientific medicine. In the eleven hospitals able to return only partial records of the new patients seen during the year, the percentage of tumours was 2.86.

It will be seen in Table 38 that of the hospitals providing complete records, the incidence of tumours was highest in the Menzies Memorial Hospital, Hwaiking (5.43 per cent. of the total patients) and lowest in the C. M. S. Hospital, Yunnan (.75 per cent. of the total patients). Examination of this table does not reveal any geographical difference in the numbers of tumours seen.

A striking fact is that the absolute number of tumours in the females approximates the number of tumours in the males, giving a percentage incidence in the females double that in the males as shown in the following table:-

Sex	Total Number of Tumours	Total Number of Patients	Percentage Tumours
Male	2,499	167,947	1.49
Female	2,352	80,775	2.91
Total	4,851	248,722	1.95

The tumour groups which produce this relatively higher incidence in the females are cancer of the breast and cervix, cyst of the ovary, and fibroma of the uterus as demonstrated in Table 40.

Detailed/.....

TABLE 39 : TOTAL TUMOURS, BENIGN AND MALIGNANT, REPORTED BY ALL SURVEY HOSPITALS FOR 1933, GIVING AGE AND SEX INCIDENCE.

TUMOURS	0 -			1 -			5 -			15 -			25 -			35 -			45 -			55 & over			Age unknown			Total			Percentage		
	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P
Adamintoma	-	-	-	-	-	-	-	-	-	4	-	4	-	1	1	1	-	1	1	-	1	2	-	2	-	-	-	8	1	9	.37	.05	.22
Adenoma	-	-	-	-	1	1	-	1	1	1	15	16	4	9	13	5	8	13	3	3	6	7	2	9	-	-	-	20	39	59	.94	1.92	1.41
Angioma	2	6	8	2	5	7	8	2	10	14	10	24	5	5	10	5	4	9	1	1	2	-	1	1	-	-	-	37	34	71	1.73	1.67	1.70
Carcinoma (a) Tongue	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	1	1	6	2	8	1	1	2	-	-	-	8	4	12	.37	.19	.29
(b) Oesophagus	-	-	-	-	-	-	-	-	-	-	-	-	2	2	4	10	1	11	21	6	27	25	4	29	-	-	-	58	13	71	2.71	.64	1.70
(c) Stomach	-	-	-	-	-	-	-	-	-	4	-	4	5	4	9	31	14	45	58	20	78	46	14	60	-	-	-	144	52	196	6.74	2.56	4.70
(d) Liver	-	-	-	1	-	1	-	-	-	3	-	3	1	1	2	10	6	16	14	1	15	15	1	16	-	-	-	44	9	53	2.06	.44	1.27
(e) Rectum	-	-	-	-	-	-	-	-	-	-	-	-	8	3	11	1	3	4	8	5	13	9	3	12	1	-	1	27	14	41	1.26	.69	.98
(f) Breast	-	-	-	-	-	-	-	1	1	-	4	4	2	26	28	3	82	85	1	124	125	5	52	57	-	1	1	11	290	301	.51	14.26	7.22
(g) Cervix	-	-	-	-	2	2	-	-	-	-	5	5	-	54	54	-	108	108	-	134	134	-	34	34	-	1	1	-	338	338	-	16.62	8.10
(h) Uterus	-	-	-	-	-	-	-	-	-	-	1	1	-	7	7	-	19	19	-	18	18	-	9	9	-	-	-	-	54	54	-	2.66	1.29
(i) Penis	-	-	-	-	-	-	-	-	-	5	-	5	17	-	17	51	-	51	56	-	56	29	-	29	1	-	1	159	-	159	7.44	-	3.81
(j) Other	1	-	1	1	3	4	1	2	3	11	9	20	42	22	64	70	29	99	81	54	135	102	39	141	2	1	3	311	159	470	14.55	7.82	11.27
Cyst (a) Ovary	-	-	-	-	-	-	-	-	-	-	52	52	-	94	94	-	75	75	-	31	31	-	18	18	-	3	3	-	273	273	-	13.43	6.55
(b) Other	2	4	6	6	5	11	10	13	23	82	28	110	54	27	81	26	16	42	13	19	32	5	5	10	2	-	2	200	117	317	9.36	5.75	7.60
Fibroma (a) Uterus	-	1	1	-	-	-	-	-	-	-	10	10	-	42	42	-	59	59	-	36	36	-	6	6	-	2	2	-	156	156	-	7.67	3.74
(b) Other	1	1	2	2	-	2	2	3	5	16	13	29	15	11	26	16	19	35	9	7	16	9	6	15	-	1	1	70	61	131	3.28	3.00	3.14
Lipoma	-	-	-	2	-	2	3	9	12	23	12	35	27	11	38	15	15	30	13	9	22	8	2	10	1	-	1	92	58	150	4.31	2.85	3.60
Papilloma (a) Penis	-	-	-	-	-	-	-	-	-	17	-	17	11	-	11	5	-	5	2	-	2	-	-	-	-	-	-	35	-	35	1.64	-	.84
(b) Other	1	-	1	3	1	4	9	4	13	84	12	96	42	8	50	14	3	17	4	2	6	5	1	6	-	-	-	162	31	193	7.58	1.52	4.63
Polyp (a) Nose	-	-	-	6	1	7	6	7	13	86	14	100	71	8	79	33	11	44	29	7	36	10	7	17	-	-	-	241	55	296	11.28	2.70	7.10
(b) Other	2	-	2	1	2	3	12	4	16	29	13	42	13	12	25	3	12	15	2	14	16	5	3	8	1	-	1	68	60	128	3.18	2.95	3.07
Sarcoma (a) Lower Limb	-	-	-	2	2	4	3	1	4	16	3	19	5	1	6	7	-	7	8	4	12	2	1	3	-	-	-	43	12	55	2.01	.59	1.32
(b) Other	6	2	8	8	4	12	8	7	15	31	13	44	40	16	56	49	11	60	28	9	37	22	8	30	-	1	1	192	71	263	8.99	3.49	6.31
Miscellaneous	-	2	2	4	3	7	14	7	21	42	16	58	55	32	87	35	35	70	28	16	44	29	20	49	-	1	1	207	132	339	9.69	6.40	8.13
Total Differentiated Tumours	15	16	31	38	29	67	76	61	137	469	230	699	419	396	815	390	531	921	386	522	908	336	237	573	8	11	19	2,137	2,033	4,170	100	100	100
Total Undifferentiated Tumours	6	6	12	10	6	16	27	21	48	68	60	128	84	66	150	65	73	138	50	46	96	49	37	86	3	4	7	361	319	681			
TOTAL TUMOURS	21	22	43	48	35	83	103	82	185	537	290	827	503	462	965	455	604	1,059	436	568	1,004	385	274	659	11	15	26	2,499	2,352	4,851			

Detailed Analysis of Tumours.

The detailed analysis of the group of tumours has been rendered difficult by the incomplete records returned in many cases. However, the nature of the Survey which involved great voluntary effort on the part of extremely hard-worked hospital staffs, did not allow of any exacting demand being made or of requests for further information in the case of incomplete returns. The chief difficulty was the use of too generalised diagnostic terms such as in the present group "tumour", "cancer", "cyst", etc. without specification of type or site. In most cases the precise histological nature of tumours could not be ascertained owing to lack of laboratory facilities or to refusal of operation or biopsy. Consequently the adoption of only a broad subdivision of the tumours was justified and the classification adopted is given in Table 39. In explanation of the table it must be pointed out that such unqualified returns as "cancer" with no site given, are classified in "Carcinoma (j) Other"; similarly, returns of "fibroma" with no site given, are classified in "Fibroma (b) Other", etc. Many records had merely a diagnoses such as "new growth" or "tumour"; these are placed in the "Undifferentiated" group. Epitheliomata have been grouped under "Carcinomata" according to site.

The most frequent forms of tumours in the groups of male and female combined and in the sexes taken separately, are shown in Table 40. In the total number carcinoma of the cervix

occupies/.....

TABLE 40 : TUMOURS IN NUMERICAL IMPORTANCE (a) ALL PERSONS, (b) MALES, (c) FEMALES.

Order of Importance	(a) Total Persons			(b) Male			(c) Female		
	Tumour	No. of Cases	Total Tumours	Tumour	No. of Cases	Total Tumours	Tumour	No. of Cases	Total Tumours
			Percent			Percent			Percent
1.	Carc. Cervix	338	8.10	Polyp. Nose	241	11.28	Carc. Cervix	338	16.62
2.	Carc. Breast	301	7.22	Carc. Penis	159	7.44	Carc. Breast	290	14.26
3.	Polyp. Nose	296	7.10	Carc. Stomach	144	6.74	Cyst Ovary	273	1.343
4.	Cyst Ovary	273	6.55	Lipoma	92	4.31	Fibroma Uterus	156	7.67

occupies first place in order of numerical importance with 338 cases or 8.10 per cent. of total tumours, while carcinomata of the breast and nasal polypus are also two large groups. Nasal polypus is the most frequent tumour in the males, forming 11.28 per cent. of all tumours reported. Many previous investigations have also noted the apparent frequency of cancer of the penis in China; in this series it forms 7.44 per cent. of all tumours in the male.

Table 41 gives the incidence of the principal forms of tumours in each hospital in numerical importance according to the classification adopted in the present report. The hospitals are again grouped in two series as in Table 38, and for purposes of discussion the first group of seventeen hospitals giving complete annual records is the more valuable. There is no constancy in the type of tumour of greatest numerical importance from hospital to hospital. Ovarian cyst is the only tumour group to occupy first place in at least four hospitals and it is an interesting fact that these hospitals are all in South China. Carcinomata of the cervix, breast and stomach occupy first place in numerical importance in two hospitals each, while the benign conditions of lipomata and nasal polypi also figure most prominently in two hospitals each.

Malignant tumours.- The relative frequency of malignant disease in different peoples and geographical areas is ever an interesting problem. Studies of the condition in the Chinese have been undertaken/.....

TABLE 41 : HOSPITAL INCIDENCE OF CHIEF TUMOUR GROUPS.

A. Hospitals giving complete records.	Tumours in order of numerical importance with number of cases.								Total tumours.
	1st		2nd		3rd		4th		
1. Severance, Seoul	Carc. stomach	52	Cyst ovary	20	Polyp nose	20	Fibroma uterus	20	323
2. Cheeloo University Tsinan	Polyp nose	14	Carc. cervix	22	Carc. stom.	21	Carc. breast	18	321
3. Menzies Memorial	Carc. oesoph	16	Carc. breast	13	Carc. cervix	9	Lipoma	8	141
4. St. Paul's, Kweiteh	Carc. breast	20	Carc. stom.	13	Polyp nose	12	Carc. oesophag	10	204
5. University, Nanking	Carc. cervix	16	Carc. breast	15	Cyst ovary	14	Polyp nose	12	218
6. Red Cross, Shanghai	Lipoma	5	Fibr. uterus	4	Carc. breast	3			77
7. Lester, Shanghai	Polyp nose	46	Carc. cervix	19	Carc. breast	18	Papill. penis	16	497
8. General, Nanchang	Carc. breast	8	Polyp nose	7	Fibr. uterus	6	Carc. stomach	5	166
9. General, Wuhu	Carc. stomach	13	Lipoma	9	Carc. cervix	6	Carc. leg	6	157
10. Kwangchi, Hangchow	Carc. breast	41	Polyp nose	27	Cyst ovary	25	Carc. cervix	23	377
11. Union, Hankow	Carc. cervix	17	Cyst ovary	13	Carc. breast	11	Carc. stomach	8	166
12. General, Changteh	Cyst ovary	7	Lipoma	5	Carc. breast	4	Polyp nose	4	102
13. Hudson Taylor, Changsha	Carc. uterus	12	Carc. breast	8	Polyp nose	8	Epulis	7	121
14. Presbyterian, Hengchow	Lipoma	9	Carc. penis	7	Polyp nose	5	Papill. penis	4	120
15. Mission, Swatow	Cyst ovary	46	Fibr. uterus	15	Polyp nose	14	Lipoma	13	372
16. Canton, Canton	Cyst ovary	30	Fibr. uterus	20	Polyp nose	15	Carc. breast	11	258
17. C.M.S., Yunnanfu	Cyst ovary	16	Carc. cervix	8	Carc. breast	6	Fibroma uterus	6	115
B. Hospitals giving partial records.									
1. P.U.M.C., Peiping	Carc. cervix	146	Carc. breast	54	Polyp nose	43	Cyst ovary	22	556
2. Mackenzie, Tientsin	Carc. penis	8	Carc. stom.	7	Lipoma	5	Carc. breast	4	64
3. General, Changte	Cyst ovary	7	Carc. oesoph	7	Carc. stom.	4			60
4. Christian, Suchowfu	Carc. breast	12	Carc. penis	9	Lipoma	6	Carc. stomach	5	164
5. Bethesda, Siangyang	Carc. breast	4							6
6. Methodist, Teian	Carc. penis	3							12
7. Methodist, Hankow	Carc. breast	6	Carc. penis	5	Polyp nose	7	Carc. cervix	7	97
8. Hunan-Yale, Changsha	Cyst ovary	9	Lipoma	8					69
9. Methodist, Wusueh	Carc. breast	3							31
10. Hope, Kulangsu	Carc. cervix	6	Polyp nose	6	Carc. breast	4			15
11. Government, Hongkong	Carc. stomach	4							29

undertaken on many occasions of which those of Maxwell (1)(2) are perhaps the most important. Maxwell found that the most frequent sites for carcinomata as seen in hospitals were the breast, cervix and penis, in that order. In the present study the results are given in the following table:-

	Condition	Cases
Male	Carcinoma penis Carcinoma stomach Carcinoma oesophagus	159 144 58
Female	Carcinoma cervix Carcinoma breast Carcinoma uterus	338 290 54
Total Persons	Carcinoma cervix Carcinoma breast Carcinoma stomach	338 301 196

The striking prevalence of cancer of the penis in China was early commented upon and various suggestions were put forward in explanation. It is well known that balanitis and other conditions due to lack of cleanliness are common, while Bercovitz (3) suggested the high percentage of syphilis treated with caustic applications by native practitioners as a cause. Carcinomata of the stomach and intestines are difficult to assess under present conditions as internal tumours are not usually seen owing to the objection to abdominal operation and to post-mortem examination. However, the study made by Guyders and Stroub (4) in the Dutch East Indies revealed a similar frequency of gastric carcinomata amongst the

Chinese/.....

Chinese there.

Table 42 gives a comparison of the four chief forms of malignancy in the present Chinese series, a series of cases in the Johns Hopkins Hospital given by Hoffman (5), and a series of pathological examinations undertaken in an Indian hospital by Nath, Lall and Singh (6). Cancer of the female generative system is the most frequent form of malignancy in both the Chinese and American groups, but occupies third place in the Indian series. It is an interesting fact that the three most frequent forms are identical in the Chinese and American hospital populations, i.e. female generative, breast and stomach.

The Age Incidence of Some Selected Tumour Groups.

The age incidence by sex of the tumour groups considered in the present series is given in Table 39 and the six more important groups are given in graphical form in Figure 22.

Cancer of the Stomach.

The largest number of cases in both sexes occurred in the age group 45-54 years. De Vries (8) in a group of Dutch autopsies gives the highest incidence of stomach cancer in both sexes in the decade 61-71 years, while Hoffman (9) gives statistics of the United States Registration Area showing that the largest number of deaths in both sexes due to this condition occurs in the age group 55-64 years.

Cancer of the Breast.

The largest number of cases in this condition too, is in the age group 45-54 years, but a difference

from/.....

TABLE 42 : A COMPARISON OF THE PRINCIPAL MALIGNANT CONDITIONS IN CHINESE HOSPITAL PATIENTS, AMERICAN HOSPITAL PATIENTS (JOHNS HOPKINS HOSPITAL) AND AN INDIAN HOSPITAL PATHOLOGICAL SERIES.

Chinese			Indian		American (Johns Hopkins)	
		No. of Cases		Total Malignant Tumours Percent		No. of Cases
1.	Carcinoma cervix	338	Breast	14.80	Female generative	380
2.	Carcinoma breast	301	Skin	13.00	Breast	291
3.	Carcinoma stomach	196	Female reproductive	8.85	Stomach and liver	202
4.	Carcinoma penis	159	Liver and digestive tract	4.80	Buccal	178

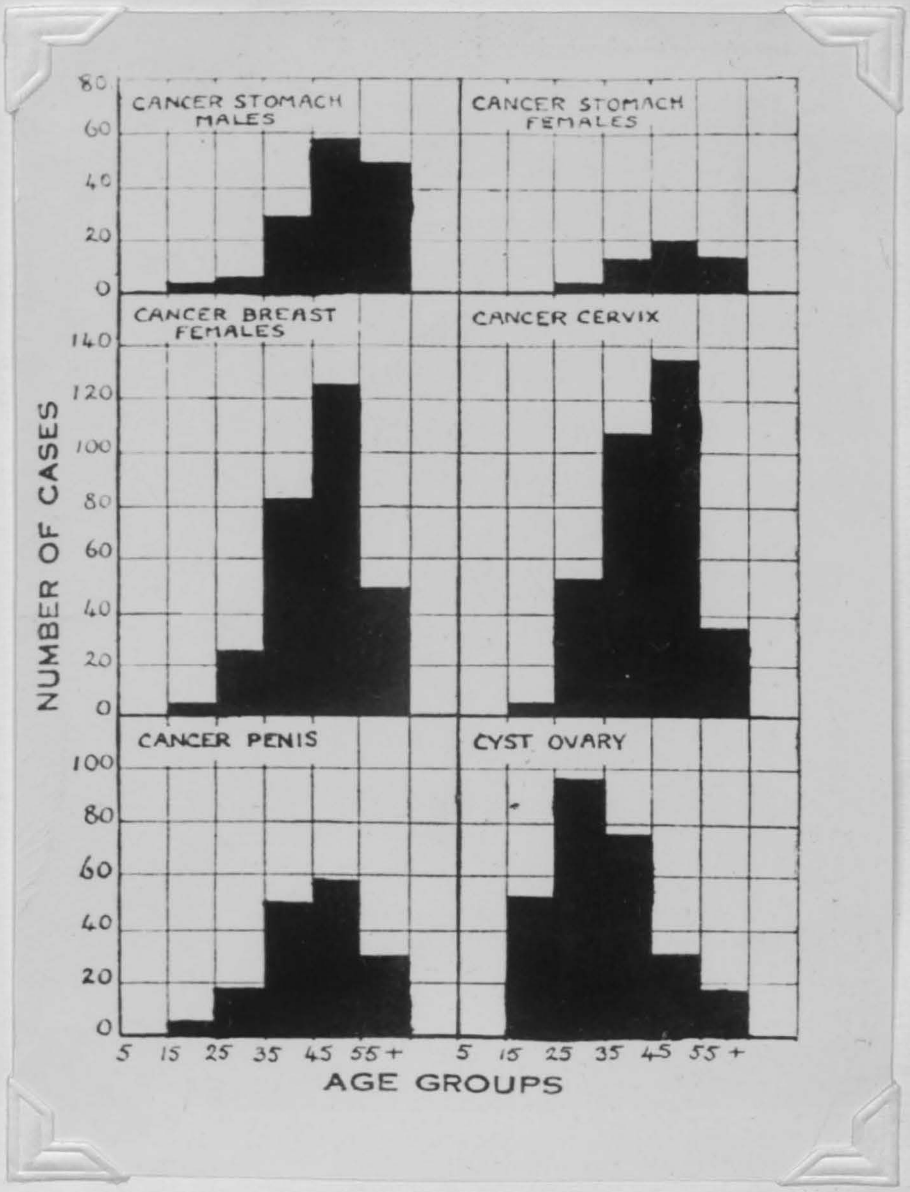

Figure 22. The age distribution of the more important tumour groups.

from stomach cancer occurs in the age group 35-44 years which is larger than the age group 55 years and over in the breast cancers, but not in stomach cancers. De Vries, in his series, had the largest number of deaths from breast cancer in the age group 51-61 years, and the United States mortality returns give the largest number in the age group 45-54 years.

<u>Cancer of the Cervix</u>.

This resembles in distribution cancer of the breast in that the largest number of cases occurs in the age group 45-54 years, followed by the age group 35-44 years. In the American mortality returns the age group 45-54 years contains the largest number of deaths due to cancer of the female generative system.

<u>Cancer of the Penis</u>.

This condition, which is unusually frequent in China's hospital populations, gives the largest number of returns in the age groups 35-44 and 45-54 years, a distribution differing from the age incidence of male gastric cancer.

<u>Cyst of the Ovary</u>.

As is to be expected, the age distribution is different from both that of cancer of the breast and cancer of the cervix in that the age group in which cases occurred most frequently is 25-34 years, with large numbers also in the age groups 15-24 years and 35-44 years.

Discussion/.....

Discussion of Age Incidence.

Hoffman (7) makes an appeal for satisfactory hospital cancer statistics which can be echoed most appropriately here for all other conditions as well. His remarks are: "It is most regrettable that the statistical reports of cancer hospitals should be of such limited practical usefulness. There is an urgent need of a national movement for uniform methods of tabulation and analysis of statistics, at least of the larger general hospitals and special institutions for the treatment of cancer patients. At present the available data can not be utilised to much practical value in a statistical study of the cancer morbidity and mortality problem, with a due regard to the examinations of age, sex, race and the organs and parts of the body affected ......"

"In view of the urgent demand for trustworthy cancer morbidity and mortality statistics, it is self-evident that the institutions which fail to provide the required amount of trustworthy and comparable statistical information, fail materially in the full discharge of their duty towards their patients, their patrons, and the public at large."

In the present study of hospital patients the age incidence of cancer of the stomach has been shown to be at least a decade earlier than the age incidence of the same conditions as seen in Dutch autopsy material on the one hand, and American mortality returns on the other. Similarly the age incidence of cancer of the breast is a decade earlier in the Chinese hospital cases than in the

Dutch/.....

Dutch autopsy returns. Unfortunately, in the absence of standardised morbidity rates and the impossibility of obtaining them at present, no direct comparison of these national materials can be made, and it is certainly unjustifiable to claim on the basis of the present hospital material that cancer shows an earlier age onset in the Chinese. It has already been pointed out in a previous chapter that Chinese hospital populations generally are of a younger average age than American hospital populations, a fact attributable to the age constitution of Chinese populations differing from American or European populations in such vital phenomena as a high birth rate and lower expectation of life.

Summary.

1. The group of seventeen hospitals situated in most of the provinces of China returned records of all new patients, both in-patients and out-patients, seen during 1933, totalling 208,045 patients, of whom 3,688 or 1.77 per cent. were diagnosed as having tumours, malignant or benign. The second group of eleven hospitals returned records of some, but not all, new patients, giving a total of 40,677 patients with 1,163 or 2.86 per cent. tumours. The incidence was twice as high in the female as in the male.

2. A short discussion of the factors governing the demand of Chinese populations for scientific medical advice notes that it is patients with external and painful tumours who are the more likely

to/.....

to seek treatment.

3. The incidence of tumours in each hospital participating in the Survey is given.

4. In the combined sexes the most frequent tumours reported in this series were:-

(a) Carcinoma cervix	8.10	per cent. of the total tumours.
(b) Carcinoma breast	7.22	per cent. of the total tumours.
(c) Nasal polypus	7.10	per cent. of the total tumours.

5. In the males the most frequent tumours were:-

(a) Nasal polypus	11.28	per cent. of total male tumours.
(b) Carcinoma penis	7.44	per cent. of total male tumours.
(c) Carcinoma stomach	6.74	per cent. of total male tumours.

6. In the females the most frequent tumours were:-

(a) Carcinoma cervix	16.62	per cent. of total female tumours.
(b) Carcinoma breast	14.26	per cent. of total female tumours.
(c) Ovarian cyst	7.67	per cent. of total female tumours.

7. The age incidence of each tumour group is tabulated and a short discussion of the five most frequent forms is given, showing that in the case of cancer of the stomach and breast the present series shows an earlier age distribution than that given in Dutch autopsy figures and American mortality returns. It is pointed out that in the absence of standardised rates this does not necessarily imply a racial difference in tumour age incidence.

1/.....

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3. Bercovitz, N. "Cancer in Hainan." Chinese Med. Jour. 34: 119, 1920.

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CHAPTER XXI.

EAR DISEASES.

In the general incidence of disease the following figures were given for the broad title of "Diseases of the Ear and Mastoid Sinus":-

1933	2.5 per cent. of all cases.
1934	2.6 per cent. of all cases.

Though eye diseases are more common in hospital populations, the above percentages are sufficient indication of the importance of ear conditions.

There are probably several reasons for this frequency, but certainly one of importance and of great interest is the procedure of ear cleansing followed by large numbers of the Chinese. Maxwell (1) gives an account of the methods adopted by the itinerant barber in ear cleansing. Hairs are clipped, and wax and the inner surface of the meatus scraped with instruments generally none too clean. Everyone has observed too, in the streets, the hawker of ear-sticks which many Chinese use frequently and usually carelessly. There inevitably follow from such customs many injuries and infections of the ear.

The title "Diseases of the Ear and Mastoid Sinus" as used in the Survey is inclusive of all diseases and conditions of the ear as given in the International List of Causes of Death for this group. Thus abscess of the ear, eczema of the ear, and numbers of other relatively minor conditions are within the group. Considering this all-embracing significance of the title, the following figures

are/.....

TABLE 43 : INCIDENCE OF CHIEF EAR DISEASES.

Disease	1933		1934	
	Male	Female	Male	Female
Otitis media	1,381	730	2,528	1,169
Otitis	806	274	649	221
Mastoiditis	131	47	190	91
Other diseases of the ear	816	390	1,501	646
Total	3,134	1,441	4,868	2,127

are striking (Table 43):-

That otitis media and otitis (a term which, owing to the vagueness of certain returns, has to be used but which can be assumed to imply otitis media) should constitute 50 per cent. of all cases which applied at hospitals for ear treatment is an unhappy confirmation of the seriousness of ear complaints in the Chinese. The incidence of mastoiditis is also depressing as approximately one patient of every twenty-five ear cases suffered from this complication.

Age and Sex Distribution.

The age and sex distribution of the two diseases, otitis media and mastoiditis, is given in Table 44.

Both diseases in comparison with the age and sex distribution of the total hospital population show an earlier age grouping. Among males it will be seen that in the case of otitis media and mastoiditis the largest proportion of cases occurs in the 5-24 years age group, but that in the total hospital population the bulk of the patients are in the age group 15-34 years. With the aetiological relationship that exists between otitis media and mastoiditis it is natural that their age and sex distribution should correspond to a large degree. These particular figures give, however, an interesting sex difference. In both diseases the female cases bulk more largely in the younger age groups than do the male cases.

Thus in the case of otitis media 14.4 per cent. of all female cases occur in the age group

below/.....

TABLE 44 : PERCENTAGE AGE AND SEX DISTRIBUTION OF OTITIS MEDIA AND MASTOIDITIS.

Age Group	Otitis Media		Mastoiditis		Total Hospital Cases	
	M	F	M	F	M	F
0 -	7.6	14.4	4.7	2.9	2.6	5.8
1 -	13.1	25.8	8.4	24.2	4.7	10.2
5 -	18.3	25.2	27.4	33.8	10.0	13.2
15 -	34.0	17.2	32.4	15.4	33.3	27.3
25 -	15.1	8.5	13.4	11.0	25.7	20.9
35 -	6.8	4.4	9.3	10.3	13.5	11.4
45 -	3.7	3.0	4.1	1.5	6.9	6.9
55 +	1.4	1.5	.3	.9	3.3	4.4
	100.0	100.0	100.0	100.0	100.0	100.0

below one year of age, while only 7.6 per cent. of male cases do so. In the case of mastoiditis the percentage of females below 5 years is 27, while that of males is 13. These are striking sex differences which further research is required to explain.

Geographical Distribution.

Examination of the records of ear disease collected by the present Survey did not reveal any geographical variations of any significance.

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1. Maxwell, James L. "The Diseases of China." 2nd Edition. 378, 1929.

CHAPTER XXII.

EYE DISEASES, WITH SPECIAL REFERENCE TO TRACHOMA.

The first European medical visitors to China were amazed at the numbers of eye affections they observed. Williams (1) quotes Dr. Lockhart as ascribing this frequency "partly to the inflammation which often comes on at the commencement of winter, and which is allowed to run its course, leaving the organ in an unhealthy condition and very obnoxious to other diseases. This inflammation is beyond the skill of the native practitioners and sometimes destroys the sight in a few days. Another fruitful source of the disease is the practice of the barbers of turning the lids over and clearing their surfaces of the mucus which may be lodged there. ..... Dense opacity of the cornea itself is frequently caused by this barbarous practice or constant pain and weeping ensues both of which materially injure the sight, if the patient does not lose it."

Chinese classical medicine also presents much evidence of an interest in ophthalmology as Lee (2) states that as early as the Sui Dynasty (589-618 A.D. the first books on the subject appeared. Treatment was never satisfactory, being usually internal medication, but "five kinds of operations were practised, namely: (a) hooking - 'blunt cutting method'; (b) cutting for removing pterygium; (c) needling for removing cataracts; (d) cauterization for ulcers and pterygia, and (e) clamping

for/.....

for trichiasis which is to shorten the lids by producing scars".

Incidence of Eye Diseases.

Modern medical literature often includes reference to the importance of eye diseases in China, culminating recently in a special issue of the Chinese Medical Journal on the subject (3). In this literature the relative incidence of the various eye diseases is usually discussed, but perhaps one of the most illuminating reports of the appalling part they play in the country is that issued from Ting Hsien. Earlier in this work the medical work of the Mass Education Movement at Ting Hsien was instanced as being one of the really significant features in modern Chinese medicine, and therefore statistics from this source carry some weight. Che'n (4) states that in this area in 1934 clinic examinations demonstrated that eye diseases were numerically the most important, returning over 30 per cent. of all cases seen. The Survey records add their testimony to the unfortunate frequency of eye diseases in China. These diseases in the Survey short list are included in two titles and numbered the following for the two years:-

		1933	1934
Title 30	Trachoma	6,905	10,456
Title 32(a)	Other diseases of the eye	8,967	14,003
Total Survey Patients		208,045	268,684

Combining these two totals gives 15,872 eye cases for 1933 and 24,459 eye cases for 1934.

Relative/.....

Relative to other disease groups these numbers are of considerable importance as the following table indicates:-

	No. of Cases	
	1933	1934
Skin diseases	45,186	54,012
Conditions of violence	22,426	25,263
Digestive conditions	15,935	22,939
Eye diseases	15,872	24,459

In 1933 eye conditions were the fourth most numerous of the major causes of disease and in 1934 they were even more important, featuring third in the list.

Owing to the importance of trachoma it has received some further consideration.

Trachoma.

Trachoma, according to Pi (5), is recognisable in the Book of Huang Ti, Nei Ching, written in 2679 B.C. Pi estimates that approximately one-third of the population of China suffers, or has suffered from the disease.

In the material of the Survey trachoma as a cause of patients seeking hospital or clinic treatment was extremely important. In 1933 trachoma was ninth and in 1934 eighth in numerical importance of all the causes of morbidity, the percentages of all hospital cases being 3.3 and 3.89 for the two years respectively. On the basis of the definitions used in the Survey the above figures imply that over 3 per cent. of all hospital and clinic admissions were on account of the major or primary complaint being trachomatous in origin. It is not an exclusive figure as eye examinations

of/.....

of hospital patients would certainly discover a much higher incidence of trachomatous lesions. Nevertheless the Survey figures are proof enough of the seriousness of trachoma as a disabling eye condition.

Geographical Distribution of Trachoma.

Curiously the Survey results are at variance with previous reports in regard to the geographical distribution of trachoma. It is usually accepted that on passing from South to North China the proportion of the population affected increases as quoted by Pi (5) and Howard (6). In 1934 the Survey gave the following figures for incidence of trachoma:-

South China	5.5 per cent. of all hospital cases.
Yangtze Region	3.4 per cent. of all hospital cases.
North China	4.2 per cent. of all hospital cases.

The fact that South China shows a higher incidence than North China is not to be accepted as an index of the amount of trachoma in the populations at large. In North China trachoma is a common complaint and lightly treated as such, but in South China it is probable that its occurrence leads to a more urgent appeal for medical treatment. The dryness and dustiness of the North China plains are believed to be important contributory factors in the incidence in that area.

Seasonal Distribution.

In 1933 in sixteen hospitals 6,833 patients complained of conditions traceable to trachomatous

infection/.....

infection and it is interesting to note that the seasonal incidence of these cases differs from that of the total hospital patients as shown in the following table:-

Month	Trachoma	Total Hospital Cases	
		Male	Female
January	6.1	4.6	5.6
February	9.3	6.3	7.4
March	10.0	8.8	9.4
April	10.1	8.5	9.0
May	9.5	10.1	9.9
June	7.4	8.8	8.8
July	7.4	9.8	8.7
August	8.8	11.1	10.2
September	8.6	9.7	9.0
October	7.4	8.3	8.1
November	8.6	7.1	7.3
December	7.0	7.0	6.7

This table would suggest that spring has some epidemiological association with the occurrence of trachoma.

<u>Age and Sex Distribution</u>.

In 1933 all hospitals, i.e. twenty-eight hospitals, co-operating in the Survey returned records of 8,221 cases of trachoma consisting of 4,947 males and 3,274 females which, under the tests available, do not suggest any significant sex distribution in this disease.

The age group 15-34 years included the great majority of cases in both sexes.

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1. <u>Williams, S. Wells</u>. "The Middle Kingdom." 2: 129, 1883.

2/.....

2. Lee, T. "A Short History of Old Chinese Ophthalmology." Chinese Med. Jour. 50: 1513, 1936.

3. Chinese Med. Jour. 50: 1323, 1936.

4. Che'n, C. C. "Public Health in Rural Reconstruction at Ting Hsien." Annual Report, 1934.

5. Pi, H. T. "Trachoma in China." Chinese Med. Jour. 50: 1465, 1936.

6. Howard, Harvey J. "Community Control of Trachoma in China." Chinese Med. Jour. 41: 1927.

CHAPTER XXIII.

SOME MISCELLANEOUS CONDITIONS.

In this chapter are gathered together a few facts about some diseases which it has been impossible to analyse or to discuss fully owing to the circumstances described in the preface. The presentation of the facts thus baldly, though probably lacking a certain immediate interest, is undoubtedly of value in providing material for reference and comparison by other investigators.

Diabetes.

The best account of diabetes as seen in the Chinese is probably that by Wong (1) which is used for comparison with the Survey material. The Survey demonstrates the universality of the disease in China. In 1933 only one hospital and in 1934 only two hospitals failed to note diabetes, but in numbers it is apparently not of importance in hospitals - 92 and 150 cases being returned for the two years respectively. Regional differences on such small numbers cannot, of course, be determined.

Wong noted in Peiping that approximately four males to one female were diabetic patients which contrasts with the Survey ratio of diabetics of 183 males to 59 females, summing the two years. As the general hospital survey ratio is two males to one female there is a suggestion of some special factor operating in the case of diabetes to produce the higher ratio.

Age/.....

Age distribution is given in the following table:-

Age Groups	No. of Cases
0 -	1
1 -	2
5 -	1
15 -	21
25 -	42
35 -	50
45 -	73
55 +	52 (1 unknown)
Total	242

This age distribution is of limited value as it is a picture of age on admission to hospital, not of the onset of the disease. Compared, however, with other disease groups described in this study, it indicates that in the Chinese, as with other races, diabetes is largely a middle-age affliction.

Beri-beri.

European observers find beri-beri one of the most interesting medical conditions to be seen in China owing to its remarkable clinical manifestations and its intriguing relations to dietetic deficiencies. Further, there is its clear-cut description from the earliest times in classical Chinese literature extending back to the Nei Ching, the well-known compendium referred to in an earlier chapter.

It is now being realised that the beri-beri seen in China is not an entity but rather a complex of deficiency conditions. Vitamins A and the B complex are involved as indicated by Platt (2).

Beri-beri in the Survey was reported throughout the country, three hospitals in 1933 and four in 1934 alone failing to report the condition. Relatively and absolutely it had its highest incidence in the hospitals of Shanghai, Canton, Yunnan and Changsha. Those hospitals which either did not see cases or but a few were naturally those in the north where millet replaces rice in the diet, viz: the hospitals of Changte, Hwaiking, Kweiteh, Paotingfu, Tientsin and Tsinan.

The sex incidence in the hospital material is unusually interesting using once again the general hospital population ratio of two males to one female as an index. There were 1,252 males to 24 females, combining the data of the two years - remarkable evidence of a male susceptibility.

Age distribution of the male cases was as follows:-

Age Groups	No. of Cases
0 -	48
1 -	10
5 -	72
15 -	645
25 -	275
35 -	112
45 -	58
55 +	24 (8 unknown)
Total	1,252

The striking concentration of the cases in the 15-24 years group is shown by these figures. Beri-beri then, it is concluded, is a disease occurring in the rice areas of China with its effects most obvious in young adult males.

Cholera/.....

Cholera.

China remains one of the regions periodically devastated by cholera, the most recent visitation being that of 1932 when hundreds of thousands of cases occurred in the Yangtze Valley alone. A certain amount of interest attaches to the Survey cholera records, as the fact that in the non-epidemic years of 1933 and 1934 cases were reported from sixteen hospitals up and down the Yangtze Region and from South China ports, led to the Central Cholera Bureau of Shanghai co-operating in a special study of these apparently endemic areas.

Dysentery and Typhoid Fever.

These diseases occurred universally and had the following seasonal distribution for 1934:-

Month	Dysentery	Typhoid
January	165	76
February	78	35
March	130	63
April	139	42
May	247	110
June	372	185
July	530	199
August	664	250
September	617	260
October	410	245
November	225	124
December	171	81
Total	3,748	1,670

Age/......

Age and sex distribution for 1933 and 1934 combined was as follows:-

Age Group	Dysentery		Typhoid	
	Male	Female	Male	Female
0 -	111	140	10	9
1 -	335	309	63	56
5 -	296	172	267	226
15 -	1,573	267	938	302
25 -	1,229	273	562	210
35 -	606	179	171	66
45 -	327	99	45	41
55 +	145	97	17	9
Unknown	28	16	5	13
Total	4,650	1,552	2,078	932

Osteomyelitis.

The deficiencies of a simple survey are illustrated in attempting to analyse the records of such a subject as osteomyelitis. A full questionnaire alone could provide an assessment of the aetiological agencies operating in the various cases. However, the general group of "osteomyelitis" may be accepted as some indication of the part taken by bone cases in hospital material. The group is not a small one as in 1934, 1,093 cases were recorded. Distribution of the cases lacked any noteworthy characteristics, while the sex ratio of 807 males to 286 females is of no significance. Practically the only positive information extractable from a preliminary analysis is given in the following table of cases classified according to regions affected:-

Cases/.....

Cases of osteomyelitis classified according to bones affected.

Bones Affected	No. of Cases
Skull	16
Jaw	375
Vertebral Column	4
Humerus	27
Radius and Ulna	13
Wrist and Hand	72
Pelvis	11
Femur	70
Tibia and Fibula	153
Foot	59
Other b ones	52
Unqualified	241
Total	1,093

The high proportion of jaw cases is the most striking feature of the table, especially as the number of cases is more than twice that of the next group, that of the tibia and fibula.

Influenza, Bronchitis and Pneumonia.

It is only possible to give seasonal incidence and age and sex distribution of these diseases. A subclassification is not yet available but epidemiologically a group relationship exists justifying presentation of the results together in this section.

Seasonal Incidence : 1934.

Month	Influenza	Bronchitis	Pneumonia
January	196	597	111
February	277	408	124
March	510	647	169
April	306	578	194
May	232	546	156
June	165	459	150
July	124	452	98
August	179	516	108
September	142	353	69
October	158	339	52
November	137	353	63
December	164	343	75
Total	2,590	5,591	1,369

The distribution of bronchitis for the year 1934 is more even than either that of influenza or pneumonia which show definite peaks in the winter and early spring months.

The age and sex distribution for 1933 and 1934 was as follows:-

Age Group	Influenza		Bronchitis		Pneumonia	
	Male	Female	Male	Female	Male	Female
0 -	77	59	537	442	343	224
1 -	114	117	561	610	334	289
5 -	209	170	625	452	124	99
15 -	1,385	394	1,851	589	285	77
25 -	1,097	209	1,143	517	187	47
35 -	465	96	669	357	113	29
45 -	173	56	463	328	66	12
55 +	27	38	240	261	26	23
Total	3,571	1,156	6,113	3,579	1,502	815

The total cases in the above table include for each disease those cases the ages of which were

not/.....

not known. Once again the three diseases show certain differences in age distribution but not in sex distribution. Influenza has a marked peak in the age group 15-34 years, while in bronchitis, though the largest age group is that of 15-34 years, it is not proportionately so prominent as in the case of influenza. Pneumonia, on the other hand, has its peak in the earliest age groups, a fact of some considerable importance from the epidemiological point of view.

Kala-azar.

The seasonal incidence of kala-azar was as follows:-

Month	1933	1934
January	29	69
February	76	39
March	111	272
April	121	247
May	145	308
June	83	237
July	103	151
August	102	164
September	102	188
October	87	152
November	110	210
December	107	140
Total	1,176	2,177

When it is remembered that the seasonal distribution of total hospital patients gives a peak in July and August, some significance attaches to the fact that the greatest number of kala-azar cases occurred in both years in March, April and May.

The/.....

The age and sex distribution was as follows:-

Age Group	1933		1934	
	Male	Female	Male	Female
0 -	6	4	14	3
1 -	182	22	377	123
5 -	445	32	848	147
15 -	276	6	294	42
25 -	129	4	178	38
35 -	44	4	74	8
45 -	10	2	20	1
55 +	6	1	1	-
Unknown	2	1	3	6
Total	1,100	76	1,809	368

Interesting results of the age and sex analysis are the great preponderance of males over females, repeated for both years, and the great concentration of cases in the early age groups with its highest intensity in the 5-14 years group.

The distribution of kala-azar has been referred to in earlier chapters where it was seen that the Survey results confirmed previous knowledge that kala-azar has a characteristic connection with the Great North Plain, the area of the sand-fly.

Rheumatic Fever, Chronic Rheumatism and Rheumatoid Arthritis and Osteo-arthritis.

In Title 22, "Rheumatic Conditions", of the Survey list was included such conditions as rheumatic fever, rheumatism and arthritis as dictated by the International List classification. This heterogeneous group demands further analysis which has been given in this section for the 1934 results.

The/.....

The records of this year, 1934, demonstrated that there were 2,943 cases or 1.10 per cent. of the total hospital patients classified in this title. These gave the following subclassification:-

Rheumatic fever	1,550 cases
Chronic rheumatism	228 cases
Rheumatoid arthritis and osteo-arthritis	1,165 cases
Total	2,943 cases

Rheumatic fever cases numbering such a large total as 1,550 is surprising as rheumatic fever is usually considered a rare disease in China. The 1934 hospitals reported the condition as shown in Table 45.

Though certain individual hospitals such as Yunnan, Changsha, Suchowfu, Hangchow and Tientsin show large numbers of cases, the regional distribution is not suggestive of geographical differences in the disease in China.

Monthly figures, too, are not indicative of a marked seasonal incidence as this table demonstrates:-

Month	No. of Cases
January	122
February	80
March	159
April	181
May	202
June	187
July	148
August	113
September	111
October	96
November	78
December	73
Total	1,550

Chronic/.....

TABLE 45 : REGIONAL INCIDENCE OF RHEUMATIC FEVER, CHRONIC RHEUMATISM AND RHEUMATOID ARTHRITIS

Region	Hospital	Rheumatic Fever	Chronic Rheumatism	Rheumatoid and Osteo-arthritis
South China	Canton	60	6	17
	Yunnan	240	18	135
	Swatow	58	10	4
	Kulangsu	3	-	10
	Foochow	10	1	13
Yangtze Region	Hengchow	13	2	25
	Changsha	121	30	6
	Hankow Methodist	25	15	14
	Hankow Union	85	17	22
	Teian	26	3	4
	Siangyang	15	3	16
	Nanking	68	1	77
	Suchowfu	119	1	61
	Nanchang	29	-	29
	Wusueh	9	5	11
	Luchowfu	54	10	32
	Wuhu	19	8	29
	Hangchow	144	16	33
	Shanghai	123	53	248
North China	Hwaiking	4	-	16
	Kweiteh	4	-	59
	Paotingfu	27	1	59
	Tientsin	259	25	101
	Tsinan	14	1	22
	Changte	21	2	122
Total Hospitals		1,550	228	1,165

Total hospital population : 268,684 patients.

Chronic rheumatism and rheumatoid arthritis are also not distinguished by regional differences in incidence in the case of the 1934 results.

Age and Sex Distribution.

The three diseases had the following sex ratios:-

Rheumatic fever	945 males to 605 females.
Chronic rheumatism	154 males to 74 females.
Rheumatoid and osteo-arthritis	706 males to 459 females.

Though chronic rheumatism parallels the sex ratio of the total hospital patients which, it is remembered, was two males to one female, the other two diseases, rheumatic fever and the arthritic group, show a definitely higher proportion of females in the ratio.

The age distribution was as follows:-

Age Group	Rheumatic Fever	Chronic Rheumatism	Rheumatoid Arthritis
0 -	5	-	3
1 -	8	2	11
5 -	85	7	34
15 -	389	47	247
25 -	368	65	257
35 -	324	51	237
45 -	234	34	233
55 +	132	22	133
Unknown	5	-	10
Total	1,550	228	1,165

1. Wang, S. H. "Diabetes Mellitus." Chinese Med. Jour. 51: 1, 1937.

2. Platt, B. S. and Gin, S. Y. "Some Observations on a Preliminary Study of Beri-beri in Shanghai." Trans. 9th Congress Far East. Assoc. Trop. Med., Nanking. 2: 407, 1934.

CHAPTER XXIV.

GENERAL RESULTS AND DISCUSSION.

The material presented in this memoir has been made available at a certain expense and only by a considerable effort on the part of many already hard-worked medical officers, and there may be those who doubt the wisdom of such a research. To these China is so obviously crippled and burdened with poverty, famine, warfare, suffering and sickness that effort and money spent in sorting record cards appears to be a somewhat frivolous approach to her medical problems. Again vital statistical and epidemiological investigations involving dispassionate accumulation of records and cold analysis of figures are repellant to many who feel that direct treatment of patients and the study of immediate clinical problems are paramount. Yet it must be remembered that history gives ample confirmation of the part played by statistical research in furthering social improvement and public health. Florence Nightingale, for instance, cannot be accused of lacking charitable instincts and yet "her statistics were more than a study, they were indeed her religion. Florence Nightingale believed - and in all the actions of her life acted upon that belief - that the administrator could only be successful if he were guided by statistical knowledge" (1).

Again, Chadwick, the great social reformer, impatient to alleviate the suffering of the poorer classes of England, demanded the use of death rates

as/.....

as an index of the causes of ill-health and misery. William Farr meticulously analysed the statistical returns of the General Register Office and first linked deaths with removable causes of filth, overcrowding and evil environment, and it was John Simon who, grasping the deep significance of Farr's work, convinced England of the necessity of State concern in, and responsibility for, the health of her people. Vital statistics thus paved the way for State medicine and still gives direction and force to all advance and consolidation in this field.

A logical attack on the reduction of human sickness and physical deficiency demands detailed knowledge of their causes, and the fuller the information of the amount, distribution and aetiology of a disease, the better is the chance of control. The particular contribution made by the present Survey is that records of disease have been amassed for the first time on a uniform basis over a continuous period of time from amongst the best available sources. Hitherto the frequent omission of out-patient records has been a serious obstacle in assessing the relative importance of any given disease as in-patient figures form but a small and selective sample of the total disease population.

This principle of uniformity governing both the collection and analysis of data has made possible the first direct comparison of disease occurrence and nature from region to region, and the results on this basis are available for direct reference by

other/.....

other investigators, both in China and other parts of the world.

Although based on hospital patients, who cannot more than any other group of selected persons be accepted as a direct index of disease in the whole population, the Survey can claim certain absolute values, for example, in so far as it shows the presence of certain specific diseases, e.g. kala-azar, scarlet fever, malaria, anthrax, beri-beri, in given geographical regions.

Morbidity studies, though lacking definition as indices of disease prevalence, have very important contributions to make to the subject of vital and medical statistics. This is discussed by Britten in the following passage:-

> "The conclusion to which we come is inevitable. The statistical data derived from medical examinations cannot be taken as an absolute measure of the health of the population. The percentage of persons found to have any specific impairment becomes, in the light of the principle set forth, a nebulous thing. We must turn the direction of our interest from such absolute figures to the relative comparisons, but in these we will find a real reward" (2).

The "relative comparisons" are, in the present instance, the studies of age, sex and seasonal distribution, and of the subclassifications of such diseases as tuberculosis, venereal diseases, tumours, respiratory and other diseases which form the substance of the present memoir. These

assume/.....

assume especial importance in the light of the little work that has been previously attempted in this field.

The population included in the Survey is one which seeks scientific medical treatment because of the existence of pain, illness or discomfort. With this as the test of morbidity its results should nevertheless be of material assistance in shaping future medical and health policies in China. The prominence of tuberculosis, crippling eye and ear diseases, venereal diseases, gastro-intestinal, helminthic and skin conditions is a further powerful argument for the need of preventive medicine. Resources, however, are so extremely limited in China that every care is required to secure the optimum benefit from their use. For instance, it is arguable whether both national and missionary organisations would not be securing the greatest return for their expenditure, equipment and staff through a system of clinics and dispensaries rather than through hospitals. Such a system, besides offering the palliative treatment so essential in converting a people to modern medicine, could also undertake the more urgent duty of spreading the gospel of sanitation and hygiene. That "prevention is better than cure" is not the unanswerable dictum it should be in all medical circles in China, and the great lesson of the Survey is surely in the call for simple education in personal hygiene and in sanitary measures throughout the country. In spite of the social and economic handicaps a great mass of the

disease/.....

disease conditions figuring in the Survey would be influenced by the adoption of such a programme.

Another factor brought out by the Survey which should be of interest to administrators is the suggestion of the type of medical personnel most necessary in hospitals in China. What is obviously wanted is a staff trained chiefly in first aid and out-patient technique on the one hand, and, on the other, a specialist group of pediatritions, ophthalmologists, ota-laryngolists, tuberculosis and venereal disease officers. The refinements of general surgical and medical treatment cannot yet be considered primary essentials in a hospital service.

The Survey, then, has given a general picture, but it was early realised that the more minute details would require different methods. Therefore the Survey was looked upon as but a part of a general programme of epidemiological research. As a first step in following the larger programme negotiations took place towards the end of 1935 with the National Health Administration, and through the courtesy of Drs. J. Heng Liu and P.Z. King of the National Health Administration, Dr. S.C. Hsu, the vital statistician to the Chinese Government, visited the Lester Institute. This had a happy outcome as arrangements were made for the National Health Administration to continue the Survey in a modified form to suit the particular needs of a state health service. Hereby was achieved the logical evolution of an epidemiological research. On a national scale and conducted as a

routine/.....

routine over many years such work will accumulate data of enormous direct importance to the control of China's health problems. Results of the Survey in its new form have already appeared (3)(4). National use of the Survey has been made in other directions. The preliminary reports of the material treated in this memoir were largely used in the official documents forwarded by China to the Conference on Rural Hygiene convened by the League of Nations for Far Eastern countries in 1937. Still other signs of the value of the Survey lie in the fact that there are scarcely any studies of an epidemiological or public health nature in China which do not draw on its records.

To return to the need for finer measures of disease occurrence, the writer, in co-operation with Dr. J.L. Maxwell, in 1935 arranged for certain detailed studies to replace the general survey in the activities of the Department. The general survey left large gaps in the assessment of the amount of dental disease, gastric disease, nutritional deficiencies, etc. By maintaining the interest of the Survey hospitals it was hoped to attempt the collection of further information concerning such disease manifestations. Several disease groups were selected for more intensive studies and, again on a card basis, these were launched on the eve of the writer's departure from Shanghai.

When originally planned the item of occupation was included in the Survey card, but it was found impossible to extract any information of value owing to difficulties of classification. Eventually it was decided that only by specific studies could the factor of occupation as a disease hazard be assessed. With this object in view the writer sought the co-operation of the industrial section of the Shanghai Municipal Council and initiated a series of studies into industrial disease in Shanghai. The first of these has been separately published (5) and others are being taken up by various members of the Lester Institute.

An especially gratifying outcome of the Survey has been the adoption of its simple statistical methods by a number of individual co-operators. These medical officers, using their own records, have initiated local epidemiological studies which have resulted in contributions of value. Such investigation lies within the reach of any practitioner, but its possibilities are richest in the fields of such medical officers as are stationed in the interior of China. Epidemiology, the study of disease in its mass phenomena, cannot be followed in the laboratory or library alone. Field observations are its "bricks and mortar", and until more medical workers appreciate the rich contributions to medical science lying within their grasp, epidemiology, the handmaiden of public health, will progress but slowly. There is an immense demand for further knowledge of the natural phenomena of all diseases, and the practitioner will do well to emulate, for instance, the performance of Dr. W.N. Pickles, a country practitioner in England, who, by careful record keeping of the

daily/.....

daily happenings in his practice, produced epidemiological reports attracting wide-spread interest. The English Ministry of Health, in complimenting this worker on his work, echoed the wish of many in desiring general practitioners to put on record their epidemiological observations.

The opportunities for epidemiological investigation are infinitely more varied and full in China than in England, and the Survey is but one contribution to an edifice which all should assist in building. Hippocrates himself shows the nature of the reward for solving epidemiological riddles when he says "And in particular, as the season and the year advances, he can tell what epidemic diseases will attack the city, either in summer or in winter, and what each individual will be in danger of experiencing from the change of regimen. For knowing the changes of the seasons, the risings and settings of the stars, how each of them takes place, he will be able to know beforehand what sort of a year is going to ensue. Having made these investigations, and knowing beforehand the seasons, such a one must be acquainted with each particular, and must succeed in the preservation of health, and be by no means unsuccessful in the practise of his art." (7)

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APPENDIX 1.

CHINESE MEDICAL ASSOCIATION
EPIDEMIOLOGICAL SURVEY.

During the recent Conference of the Chinese Medical Association, held at the Henry Lester Institute of Medical Research, from September 29th to October 6th, it was resolved that an effort should be made to collect information which might throw light upon the prevalence and incidence of disease in China. To this end a very simple enquiry card has been prepared and this should shortly be in circulation to all interested in the furtherance of this project, which, to prove reasonably successful, will require the ready co-operation of the medical officers in hospitals, institutions, etc., in various parts of the country.

We shall be glad to know, therefore, whether we can count on your support, and if we may, we should be grateful if you would complete, detach, and forward the form below, stating approximately how many of the reporting cards per month you consider necessary. These cards will be supplied free by the Henry Lester Institute of Medical Research and will be returned (under instructions to be issued later) to the Institute for analysis and tabulation. Summary analyses of records will be transmitted to persons participating in the enquiry.

We beg respectfully to remind you that, in view of the fact that every effort is being made to bring this scheme into operation on January 1st, 1933, you will be good enough to supply the

information/.....

information asked for below with the minimum delay, so that our organisation may be completed.

On Behalf of the Research Council of the C.M.A.

(Signed) H. G. EARLE.

Chairman Research Council C.M.A.

To:- The Department of Preventive
Medicine & Medical Statistics,
The Henry Lester Institute of
Medical Research,
1320 Avenue Road,
Shanghai.

With reference the Epidemiological Survey, Chinese Medical Association, it is estimated we shall require each month, approximately

.... cards for records of New In-patients.

.... cards for records of New Out-patients.

Signed. ....

Address. ....

....

APPENDIX 2.

Sample of the Survey Card.

IN-PATIENT.
FEMALE.

(1) Serial No. ....

(2) Name of Hospital, Institution, etc.

....

City or Town. ....

(3) Date of Admission. ....

(4) Present domicile - County. ....

Province. ....

(5) Past domicile - County. ....

Province. ....

(6) Age. .... Birth month. .....

(7) Occupation. ....

(8) Malady. ....

(9) Remarks. ....

....

....

....

Initialled by. ....

See Schedule A for instructions.

Indicate with a dash (——) where information not available.

APPENDIX 3.

CHINESE MEDICAL ASSOCIATION.

Epidemiological Survey.

Object: The object of the survey as resolved at the Conference of the Chinese Medical Association held at Shanghai in October, 1932, represents an attempt to obtain more dependable and detailed information relating to the distribution and prevalence of disease in China, by the collection, analysis, and tabulation of hospital data.

Proposed Method of Survey: It was decided to investigate this problem by securing the participation of selected representative hospitals in a general enquiry as to the numbers and types of cases admitted by them. Information of these cases will be entered on simple record cards, one card to each new patient, and at regular intervals all completed cards will be forwarded to the Department of Preventive Medicine and Medical Statistics, Henry Lester Institute, 1320 Avenue Road, Shanghai, for analysis and tabulation.

It is realised that to be practicable, the investigation should impose the minimum of additional labour upon hospital authorities, since all hospitals in China are overworked, and would be unable to take part in any elaborate investigation.

Preliminary Organisation: A letter was drafted and forwarded to selected hospitals with a view to determine:-

(a) Whether such hospitals were prepared to co-operate.

(b) The approximate number of enquiry cards required for the proposed investigation.

On receipt of replies to this circular letter steps were taken for the printing and distribution of cards and other necessary literature.

The Record Card: The form of card to be adopted was determined only after prolonged consideration in the interests of hospitals and the Department of Preventive Medicine and Medical Statistics alike. Thus the card has been designed with a corner clipped off to facilitate stacking, and issued in four colours to distinguish male and female, out-patient and in-patient cases. The card requires information under the following headings:-

1. Serial No.
2. Name of hospital, institution, etc. City or town.
3. Date of admission.
4. Present domicile - county - province.
5. Past domicile - county - province.
6. Age - birth month.
7. Occupation.
8. Malady.
9. Remarks.

It is believed that such particulars as the above are already recorded by most hospital authorities for both in- and out-patients, and hence, the survey requires merely the transcription of facts already available in the majority of cases. A brief schedule of instructions (Schedule A) accompanies all cards distributed, defining items required, discussing possible difficulties, and submitting suggestions relating to methods of entry

of/.....

of prescribed facts. The following notes have reference to specific items appearing upon the record card:-

1. Serial Number.

As the name of the patient is not required for tabulation purposes, the serial number is merely intended to provide a means of identifying the card relating to a particular patient. Hospital authorities will, therefore, adopt serial numbers which have direct reference to their own case sheets or records, at will.

2. Name of Hospital, Institution, etc.

The name of the city or town to be recorded refers to the situation of the hospital, institution, etc., and not to the habitual residence of the patient.

It is suggested that these particulars might be recorded by means of a rubber or other stamp device.

3. Date of Admission.

It is obvious that even a simple survey can claim little useful purpose unless it demonstrates some indication as to when patients seek treatment. The significance of a seasonal distribution of the incidence of disease is undoubted, and explains the request for information as to the date of admission of patients. Therefore, this item of information should record:-

(a) The date when patient was admitted to hospital as an in-patient; or

(b) The date when patient was first seen as an out-patient.

The/.....

The fundamental principle postulates the following requirement:-

<u>One record card for each new case and avoidance of duplicate cards for the same case</u>.

Thus two corollaries follow:-

(1) A return visit of a patient with the same condition a new card is <u>not</u> issued.

(2) A return visit of a patient with a different condition a new card <u>is</u> issued.

For example:-

(1) A patient with chronic pulmonary tuberculosis receiving treatment for this condition on two or more seperate occasions is issued with one card <u>only</u>.

(2) A patient receiving treatment for pneumonia on his first visit and for dysentery on his second visit is treated as two cases and issued with <u>two cards</u>.

Transfers of cases occur in hospitals in two directions, from the out-patient department to the wards for in-patient treatment, and from the wards to the out-patient department.

Where such transfer is the result of the development of a new condition, the patient is a new case and as such receives a new card, out-patient or in-patient as the case may be.

<u>In-patient transferred to out-patient</u> - does <u>not</u> require issue of new card.

<u>Out-patient transferred to in-patient</u>:

(a) Where transfer due to development of a new condition (i.e. new malady) issue new card.

(b)/.....

(b) Where transfer made for same condition, patient to be considered as an in-patient, and the out-patient card destroyed.

When out-patient transferred to in-patient for same condition after 14th of month, i.e. after his out-patient card has already been forwarded to the Department for previous month or an earlier month, then, as this case has already been listed on receipt of its out-patient card, the only method to avoid duplication of entries is <u>not</u> to issue an in-patient card.

4. <u>Present Domicile</u>.

It is requested that this information be given in every case and entered by county and province with a view to indicating the county or province in which the patient resided at the time of sickness or injury.

5. <u>Past Domicile</u>.

This item seeks an answer to the question "Where did the patient contract his disease ?" and in many cases a dependable answer will be extremely difficult, if not impossible, to secure; neither is it possible - having regard to the extreme variations of the developmental stages characterising certain morbid conditions - to suggest an arbitrary time limit defining "past domicile".

Medical officers are invited to record their opinions in such cases. After all, they alone possess the relevant facts and it is hoped an endeavour will be made to obtain data under this heading.

The/.....

The value of such opinions will of necessity vary according to the experience and interest of the medical officer concerned, and yet, the resultant information, imperfect and incomplete though it may be, will prove a reasonably trustworthy index of regional distribution of disease.

For example, on diagnosing schistosomiasis, a condition not known to exist in a specific area, the medical officer will be stimulated to discover some particulars relating to the past travels of the patient. This example is quoted merely by way of illustration, for it is believed that in the majority of cases no entry under "past domicile" will become necessary.

It is believed that the most accurate rendering of the county names will be in Chinese characters, so where the English or Romanised equivalent as used by the Post Office Guide is not known, the domicile should be given in Chinese characters.

6. Age.

Much thought was given to choosing the minimum data which would enable age to be calculated simply and yet could be elicited easily.

It was the opinion of those conversant with China that the majority of patients likely to be questioned in hospital could give their Chinese age and Chinese month of birth, though only a few could be expected to know the year of birth by any calendar.

Trials have confirmed this view, and hence the facts required are - Chinese age and Chinese

(lunar)/...

(lunar) month of birth. In the case of children with a Chinese age of two years and under, the entry should be made in months.

The calculation of the Western equivalents from these facts will be undertaken at the Department of Preventive Medicine and Medical Statistics.

7. <u>Occupation.</u>

Under this heading avoidance should be made of vague terms such as "labourer" or "coolie", and occupations given definite descriptions, e.g. "dock labourer", "worker on roads", etc. Individuals may, during any year, follow one or more occupations. In these circumstances, the nature of the occupation most generally followed should be given.

8. <u>Malady</u>.

This being the fundamental fact required, much deliberation ensued before agreement was arrived at its definition. The discussion turned on whether the diagnosis, ultimately considered to be of major importance, should be entered here, or under another heading. As was suggested at the initial meeting, the main fact required is the cause which leads to the visit of a patient for treatment. However, the frequent possibility of this cause not coinciding with a more serious pathological condition has not been lost sight of, and the discovery of further infections, complications or associated conditions can be listed under the item labelled 9 - Remarks.

Similarly, it is admitted that a diagnosis of any sort, accurate or inaccurate, is often difficult to obtain and more especially would this

be/.....

be true of crowded out-patient clinics. This does not mean that these patients who, under the exigencies of the situation have often to be treated only symptomatically, are not of interest or value in the returns to be made. It is most essential that every new patient passing through institutions during the course of the survey should be taken account of, and it is desired that cards be returned for all, even for those patients whose morbid condition is, after examination, but vaguely diagnosed. Though a vague diagnosis, a symptomatic one, may not be a true picture of an individual patient, yet such diagnoses are of great value in that they may indicate mass disease phenomena and trend in a given locality. Simple examples may be given of gastric enteritis cases increasing in out-patient clinics concurrently with an outbreak of cholera, or of "colds" and "flu's" going hand in hand with respiratory disease waves. Thus medical officers will contribute to the interest and value of the survey, not only by making as accurate diagnoses as possible throughout, but also by entering under the "Remarks" column some features of a case which are, in their opinion, predominant. In such cases where it is felt necessary to record more than one disease on the same card, medical officers are invited to "underline" or "ring round" the condition they deem of greater importance, and such indication will be followed in tabulation of data. (See also below under "Remarks".)

9. Remarks.

The entry on the card under the heading

"Malady"/.....

"Malady" will be the cause determining the visit of the patient to hospital, and this, subject to specific exceptions referred to in paragraph 8 above, will be the ailment tabulated.

Subsequent diagnoses, complications or infections, discovered in the patient before return of the card, should be entered under the "Remarks" column. This item is designed to prevent the enquiry being too rigid, as it gives scope for a variety of entries not capable of being categorically listed. Further, diagnoses are frequently not made on first examination of a patient and the provision of time for the examining medical officer to return as accurate a picture as possible of the types of cases under his care was deemed necessary. The longer period available for securing revised opinion of a case the better, yet the organisation rendered necessary under the present scheme of the survey requires fairly frequent and regular collection of cards. These two opposing conditions led to the adoption of the instruction for requesting "the cards of any one month being forwarded not later than the fourteenth day of the month next following to the Department". It is believed the adoption of this plan will result in returns of sufficiently accurate diagnoses for the purpose of the survey.

The medical officer will give indication of his opinion as to which is the major condition present by "underlining" or "ringing round" this item. (See paragraph 8 above.)

In/.....

In the list of instructions (Schedule A) and under the "Please Note" remarks, points are listed which, if observed, will materially help the arduous labour of analysis and tabulation. Most are self-explanatory, or have been discussed above, but it may be stated that the object of requesting the despatch of a copy of Schedule B with the cards is to ensure that a check is kept on the number received at the Department with the numbers of cards forwarded from the hospital.

The concluding paragraphs of Schedule A have reference to the "Analysis of Returns" and the intention to supply all participating hospitals with detailed summaries of their monthly records. In return for their valuable co-operation in an enquiry of first-rate importance, participants will have the satisfaction of knowing that the statistical section of their annual reports is gradually accumulating, so rendering unnecessary the preparation and compilation of these data by over-worked staffs at the end of a year's work; moreover, these summaries will provide more complete statistical information than is usually available in the majority of hospital reports since the data will not only enable seasonal incidence to be traced, but will present the distribution of principal ailments, accidents, etc., with distinction of both sex and age.

In conclusion, it remains to say that in attempting the organisation of a simple card survey such as this, many arbitrary decisions touching methods and routine have been inevitable. It is

by/.....

by no means believed that a perfect system has been devised; actual practice will undoubtedly reveal defects, but participants are invited to implement the scheme by adhering for the present as closely as possible to the various suggestions which have been made, and to submit their criticisms and recommendations for improvement in the light of their own experience arising out of actual working conditions. All such criticisms and recommendations will be welcomed and applied as opportunity permits for perfecting the present organisation.

APPENDIX 4.

SCHEDULE A : INSTRUCTIONS.

CHINESE MEDICAL ASSOCIATION.

Epidemiological Survey.

Instructions for Completion of Medical Record Cards.

(These instructions should be carefully preserved for reference.)

Principle:- One record card for each new patient.
A return visit of patient with same condition new card not issued.
A return visit of patient with different condition new card issued.

1. The Serial Number:

As the name of the patient is not required on the medical record card the serial number should provide a means of identification. Medical officers should therefore adopt serial numbers which have direct reference to their own case sheets or local records.

2. Name of Hospital, Institution, etc.:

The name of the city or town to be recorded refers to the situation of the hospital, institution, etc., and not to the habitual residence of the patient.

3. Date of Admission:

For both in-patients and out-patients this item of information should record:-

(a) The date when patient was admitted to hospital as an in-patient; or
(b) The date when patient was first seen as an out-patient.

4/.....

4. <u>Present Domicile</u>:

Under this heading will be recorded the county and province in which the patient was residing when taken ill or injured.

5. <u>Past Domicile</u>:

<u>Where the patient contracted his disease</u> is the fact required and it is hoped that officers concerned will make every endeavour to obtain this information and enter it by county and province under this heading where it differs from present domicile. Having regard to the difficulties attending the discovery of precise information, no arbitrary rule can be framed and final decision on this point must, of necessity, be left to the judgment and discretion of local officers. Entries of domicile to be made in Chinese characters or in Romanised form only if Post Office equivalent used.

6. <u>Age</u>:

Two facts are required under this heading. Firstly, the age in years, and secondly, the number of the month in which the patient was born, both being given according to the Chinese calendar. With infants under two years, the age should be returned in months.

The conversion to Western standards will be made from these facts by the Department of Preventive Medicine and Medical Statistics.

If precise particulars are unobtainable, approximate ages should be entered, together with the word "approximate".

7. <u>Occupation</u>:

Individuals may, during any year, follow one or more occupations. In these circumstances the nature of the occupation most generally followed by the patient should be recorded. Such indefinite terms as "labourer", "worker", etc. should be avoided and defined more precisely, e.g. by stating the <u>nature</u> of the occupation, i.e. "dock labourer", "worker on roads", etc.

8. <u>Malady</u>:

Under this heading will be recorded the name of the disease, accident, etc. <u>which determined the visit of the patient for treatment</u>.

9. <u>Remarks</u>:

While the patient is under observation or treatment, complications, infections. etc. in addition to the original cause of sickness may be discovered. Reporting officers are invited to enter additional information, contributory causes, complications, etc. under this heading.

<u>PLEASE NOTE</u>.

Very material assistance can be rendered and the success of this collective enquiry more reasonably assured by special observance of the following rules:-

(a) That all entries are clearly legible.

(b) That records should inscribe the facts as briefly as possible.

(c) That all cards completed between the first and last days of any month shall be forwarded not later than the fourteenth day of the month next

following/.....

following, to:-

The Department of Preventive
Medicine and Medical Statistics,
The Henry Lester Institute of
Medical Research,
1320 Avenue Road,
Shanghai.

Cards forwarded for analysis should, on all occasions, be accompanied by one copy of Schedule B (attached).

(d) That these cards should be brought into use on 1st January, 1933, and thereafter maintained carefully and regularly throughout each year.

(e) That the practice followed in analysing the results at the Henry Lester Institute will be to tabulate as the disease the entry on the card under "Malady". On the other hand, medical officers may find that subsequent examinations reveal more serious disease. Consequently, medical officers are invited to "ring round" the disease they consider of primary importance for tabulation.

Sex: It will be observed that different coloured cards are provided for the sexes and for in-patients and out-patients respectively. This provision has been made to facilitate the very heavy sorting of records which, inevitably, will arise.

ANALYSIS OF RETURNS.

The data received will be analysed, and tabulated results will be forwarded with all possible dispatch to individuals, hospitals, institutions, etc.

concerned/....

concerned. These summaries will indicate the principal ailments, accidents, etc., with distinction as to age and sex.

At the end of a complete year an endeavour will be made to supply an annual summary of the facts enumerated in the monthly returns for each hospital, institution, etc.

All medical record cards will be retained at the Henry Lester Institute of Medical Research. They will, however, be available for reference should occasion arise.

APPENDIX 5.

CONVERSION OF CHINESE AGE.

The solar calendar, though given the official blessing of the Chinese Government, has not yet been adopted by the masses. To them time is still governed by the sixty year cycle with its lunar year, intercalary months, and innumerable meanings in terms of the Zodiac and other astrological features. As the calendar and almanac loom so large in the spiritual life of any and every Chinese, his age and his birthday are of supreme importance and are known to him however illiterate he is. The problem arose, however, of giving the age of the Chinese in terms not of the lunar calendar, but of the solar calendar and, guided by the necessity of reducing as far as possible the work of filling in record cards in the busy clinics and wards of hospitals, some thought was given to choosing the minimum data enabling age to be calculated simply and yet which would be easy to elicit.

The majority of patients likely to be questioned in hospital are able to give their Chinese age and the Chinese (lunar) month of their birth, though only a proportion can be expected to give the year of their birth either by the cyclic or dynastic calendar. Thus P. H. Stevenson states in discussing the application of his slide-rule (1):- "The slide-rule continues to be of very great use when dealing with subjects who are able to tell definitely the exact year and month of their birth

in/.....

in terms of the Chinese calendar, from which information the real age in years and months is directly determined by the sliding member of the rule in question. Many individuals, however, are unable to state off-hand the year of their birth, although quite capable of giving their Chinese age and the month of their birth."

This finding was fully confirmed in the wards and out-patient departments of the Lester Chinese Hospital when examinations were made of patients on this point. In practically all cases the Chinese age and the lunar month of birth were given, but in only relatively few was the year of birth given, and of these some gave the cyclic date and others the dynastic year.

Led by these considerations it was decided that the Chinese age and Chinese (lunar) month of birth were the data to be obtained for the purposes of the Survey. These facts fulfil the conditions necessary for the ease of operation of the Survey in that they are usually elicited quickly and provide enough data for a rapid conversion to Western standards.

Stevenson arrived at a formula based on the Chinese age and month of birth from which he constructed a table of subtractions enabling conversion to be performed readily. In considering this and other methods a simple empirical rule was evolved by the writer which enables the two variables used by Stevenson to form the basis of a simple mental calculation for immediate conversion.

Rule/.....

<u>Rule:</u> Given:- Chinese age.
Lunar month of birth.

To determine age in terms of Western reckoning

(i) Subtract 2 years from Chinese age in years.

(ii) Add one month to lunar birth month.

(iii)(a) If month in which enquiry is made is earlier than lunar month so obtained, no addition made to age in years as obtained above.

(b) If month in which enquiry is made is later than lunar month so obtained, then one year added to age in years to obtain Western age in years.

(iv) Count <u>forward</u> from lunar month as obtained above (i.e. lunar month as given + 1) to month of enquiry to obtain age in months.

These rules are easily memorised and were found most suitable for use by Chinese technicians undertaking the coding of the cards. If the following examples are compared with Stevenson's table (2) it will be seen that they correspond.

Given:- Chinese age in years.
Lunar month of birth.
Enquiry made in July (7th solar month)

Age Given Chinese	Month of Birth Lunar	Western Equivalent July According to Above Calculations
37	11	35 7/12 years.
19	5	18 1/12 years.
10	4	9 2/12 years.
29	6	28 0/12 years.
17	9	15 9/12 years.
41	6	40 0/12 years.
54	8	52 10/12 years.

1/....

1. Stevenson, Paul H. "A Slide-rule for Computing and Converting Chinese Dates and Ages." Chinese Med. Jour. 36: No. 4, 1922.

2. Stevenson, Paul H. and Pan Ming-Tzu. "On Converting Chinese Ages to their Foreign Equivalents : A Conversion Formula and Table of Subtractions." Chinese Med. Jour. 40: 1926.

APPENDIX 6.

Schedule C.

CHINESE MEDICAL ASSOCIATION.

Epidemiological Survey.

(The Henry Lester Institute of Medical Research, 1320 Avenue Road, Shanghai.)

Summary analysis of medical records for the month of ....19 ...... Name of hospital ....City or town ....

Province ....Number of cards received ,.................Males ,........Females ....

OUT PATIENTS.

AGE AND SEX.

Title	Corresponding Title No. in International List.	0 -			1 -			5 -			15 -			25 -			35 -			45 -			55 and over.			Age unknown.			Totals.		
		M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.
1. Typhoid and Paratyphoid Fevers	(1,2)																														
2. Typhus	(3)																														
3. Relapsing Fever	(4)																														
4. Smallpox	(6)																														
5. Measles	(7)																														
6. Scarlet Fever	(8)																														
7. Diphtheria	(10)																														
8. Influenza	(11)																														
9. Cholera	(12)																														
10. Dysentery	(13)																														
11. Plague ,.........	(14)																														
12. Cerebro-spinal Fever	(18)																														
13. Tuberculosis of the Respiratory System	(23)																														
14. Other Tuberculous Diseases	(24-32)																														
15. Leprosy	(33)																														
16. Venereal Diseases	(34,35)																														
17. Malaria	(38)																														
18. Kala-azar	(In 39)																														
19. (a) Schistosomiasis	(In 42)																														
(b) Other Helminthic Infections	(40-42)																														

20/ ....

Title	Corresponding Title No. in International List.	0 -			1 -			5 -			15 -			25 -			35 -			45 -			55 and over.			Age unknown.			Totals.		
		M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.
20. Other Infectious and/or Parasitic Diseases	(5,9,15-17, 19-22,36, 37,39,43, 44)																														
21. Cancer and other Tumours	(45-55)																														
22. Rheumatic Conditions	(56,57)																														
23. Diabetes	(59)																														
24. Beri-beri	(61)																														
25. Other General Diseases	(58,60, 62-66,69)																														
26. Diseases of the Blood	(70-74)																														
27. Acute and Chronic Opium Poisoning	(In 76, in 179)																														
28. Other Chronic Poisoning	(75-77)																														
29. Cerebral Haemorrhage, Apoplexy, etc..	(82)																														
30. Trachoma	(In 88)																														
31. Diseases of the Ear and Mastoid Sinus	(89)																														
32. Other Diseases of the																															
(a) Eye	(88)																														
(b) Nervous System and Sense Organs	(78-81, 83-87)																														
33. Diseases of the Circulatory System	(90-103)																														
34. Bronchitis	(106)																														
35. Pneumonia - all forms	(107-109)																														
36. Other Diseases of the Respiratory System	(104,105, 110-114)																														
37. Diarrhoea and Enteritis	(119,120)																														
38. Appendicitis	(121)																														
39. Hernia, Intestinal Obstruction..	(122)																														
40. Anal Fistula, Fissure	(In 123)																														
41. Diseases of the Liver and Biliary Passages ..	(124-127)																														
42. Other Diseases of the Digestive System	(115-118, 123,128, 129)																														

43/ ....

Title	Corresponding Title No. in International List.	0 -			1 -			5 -			15 -			25 -			35 -			45 -			55 and over.			Age unknown.			Totals.		
		M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.
43. Nephritis	(130-132)																														
44. Other Diseases of the Genito-urinary System	(133-139)																														
45. Diseases and Conditions, Pregnancy, Child-birth, Puerperium	(140-150)																														
46. Diseases of the Skin, Cellular Tissue, Bones and Organs of Locomotion	(151-156)																														
47. Congenital Malformation and Conditions early Infancy	(157-161)																														
48. Suicide	(163-171)																														
49. Other Conditions of Violence	(172-198)																														
50. Ill-defined and Miscellaneous Conditions	(162,199, 200)																														
	TOTALS																														

COMMENTS :

DESPATCHED (DATE)..........................